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NATIONAL INTELLIGENCE SURVEY

U.S.S.R.

GENERAL SURVEY

MARCH 1971



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This General Survey supersedes the one dated September 1968, copies of which should be destroyed.

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GLOSSARY

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ABBREVIATION	RUSSIAN	ENGLISH
APN (or Novosti)	<i>Agentstvo Pechati Novosti</i>	News Press Agency
APVO	<i>Aviatsiya Protivoyozdushnoy Oborony Strany</i>	Aviation Air Defense
AUCCTU	<i>Vsesoyuznyy Tsentral'nyy Sovet Professional'nykh Soyuzov</i>	All-Union Central Council of Trade Unions
CEMA	<i>Sovet Ekonomicheskoy Vzaimopomoshchi</i>	Council for Economic Mutual Assistance
CPSU	<i>Kommunisticheskaya Partiya Sovetskogo Soyuz</i>	Communist Party of the Soviet Union
DOSAAF	<i>Dobrovol'noye Obshchestvo Sodeystviya Armii, Aviatsii, Flotu</i>	Voluntary Society for Cooperation with the Army, Aviation, and the Fleet
GKES	<i>Gosudarstvennyy Komitet Soveta Ministrov SSSR po Vneshnim Ekonomicheskim Svyazam</i>	State Committee of the Council of Ministers, U.S.S.R., on Foreign Economic Relations
GKNT	<i>Gosudarstvennyy Komitet po Nauki i Tekhniki</i>	State Committee for Science and Technology
Gosplan	<i>Gosudarstvennyy Planovyy Komitet</i>	State Planning Committee
GRES	<i>Gosudarstvennaya Rayonnaya Elektricheskaya Stantsiya</i>	State Regional Electric Powerplant
GRU	<i>Glavnoye Razvedyvatel'noye Upravleniye</i>	Chief Directorate for Intelligence
GUGK	<i>Glavnoye Upravleniye Geodezii i Kartografii</i>	Main Directorate of Geodesy and Cartography
GUGMS	<i>Glavnoye Upravleniye Gidrometeorologicheskoy Sluzhby</i>	Main Directorate for Hydrometeorological Services
INFLOT	<i>Morskoye Agentstvo po Obsluzhivaniyu Inostrannykh Sudov v Portakh SSSR</i>	Maritime Agency for Servicing Foreign Ships in Soviet Ports
JINR	<i>Obedinennyy Institut Yadernykh Issledovaniy</i>	Joint Institute of Nuclear Research
KGB	<i>Komitet Gosudarstvennoy Bezopasnosti</i>	Committee for State Security
LRA	<i>Dal'naya Aviatsiya</i>	Long Range Aviation
MCA	<i>Ministerstvo Grazhdanskoy Aviatsii</i>	Ministry of Civil Aviation
MOC	<i>Ministerstvo Svyazi</i>	Ministry of Communications
PVO Strany ..	<i>Protivoyozdushnoy Obrony Strany</i>	Air Defense Forces
R.S.F.S.R.	<i>Rossiyskaya Sovetskaya Federativnaya Sotsialisticheskaya Respublika</i>	Russian Soviet Federated Socialist Republic
TAC	<i>Frontovaya Aviatsiya</i>	Tactical Aviation
VLKSM (or Komsomol)	<i>Vsesoyuznyy Leninskiy Kommunisticheskiy Soyuz Molodezhi</i>	Communist Youth League
VTA	<i>Voyenno-transportnaya Aviatsiya</i>	Military Transport Aviation
VUZy	<i>Vysshie Uchebnyye Zavedeniya</i>	Higher educational institutions
VVS	<i>Voyenno-vozdushnyye Sily</i>	Soviet Air Forces
ZAGS	<i>Byuro Zapisi Aktov Grazhdanskogo So-</i> <i>stoyaniya</i>	Government Civil Registry Office

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Chronology

400-700	Territory of present-day European Russia is settled by Eastern Slavs.
700-800	Prosperous mercantile state with Khazar hegemony over Slavs is established between lower Volga and Dnepr rivers.
800-912	Vikings under Rurik use river routes, to penetrate Russia; Kiyev becomes center of their dominion.
990	Christianity is introduced by Vladimir the Saint.
1237-1240	European Russia is conquered by the Mongol Golden Horde, beginning two centuries of Tatar rule.
1380	Prince Dmitry of Muscovy inflicts first defeat on Tatars in Battle of Kulikovo Field, laying basis for rise of Muscovy in 15th century.
1533-1584	Ivan the Terrible reigns, proclaiming self tsar of the "third Rome," Muscovy, and beginning settlement east of Urals.
1637	Russian pioneers reach Pacific coast of Siberia.
1689-1725	Peter the Great reigns, embarking on far-reaching reforms to "Westernize" Russia and founding Saint Petersburg (now Leningrad).
1762-1796	Catherine the Great continues "Westernization" of Russia, partitions Poland to increase European Russian territory, inaugurates Russian drive for warm-water ports by acquiring Crimea.
1801-1825	Alexander I reigns, withstanding Napoleonic invasion which reaches Moscow and in the wake of which the Russian army penetrates France.
1825	Revolt of Decembrists, a small group of noblemen favoring social reform, fails.
1825-1855	Nicholas I institutes reactionary regime based on autocracy and Russification, inaugurating systematic use of secret police against the people.
1857-1861	Alexander Herzen's revolutionary thought in the weekly <i>Kolokol</i> (The Bell) is published abroad with profound impact on Russian intellectuals.
1861	Serfs are emancipated and commune-type system of peasant social organization is established.
1876	First Russian revolutionary party, called Land and Liberty (later People's Will), is formed by Populists.
1881	Mounting revolutionary activity of Populists culminates in assassination of Alexander II.
1881-1894	Alexander III initiates severe repressions of revolutionaries and fosters pan-Slavism.

1898	March	First Congress of the Russian Social Democratic Labor Party (RSDLP), identified by Soviet Communist Party as its first congress, is held in Minsk.
1903	August	Second Congress of the RSDLP is held in Brussels and London, ending in split into Bolshevik and Menshevik factions.
1905	October-December	First Russian Revolution results in a constitutional reform.
1914	August	Germany declares war on Russia.
1917	March	February revolution results in abdication of tsar and formation of Provisional Government.
	November	Bolsheviks seize power in October revolution and Lenin becomes Premier.
1918	March	Signing of Treaty of Brest Litovsk removes Russia from war. Bolshevik faction of the Russian Social Democratic Labor Party renames itself the Russian Communist Party (Bolsheviks).
1918-1921		Bolsheviks ultimately prevail over foreign intervention and civil war.
1921	August	New Economic Policy (NEP) is introduced.
1922	April	Stalin is elected General Secretary of the Communist Party (Bolsheviks).
	December	Founding congress of the Union of Soviet Socialist Republics (U.S.S.R.) is held.
1924	January	Lenin dies.
1928	October	NEP is abandoned. First Five Year Economic Plan (1929-33) goes into effect.
1929	January	Trotsky is exiled from U.S.S.R.
1930	January	Forced collectivization of peasantry begins.
1932-1933		Millions die during serious famine.
1934	December	Kirov, Stalin's viceroy in Leningrad, is assassinated; Stalin starts "great purge" and reign of terror.
1936	December	"Stalin Constitution," which with minor modifications is still in effect, is adopted.
1939	March	18th Congress of All-Union Communist Party (Bolsheviks) is held.
	August	Stalin-Hitler Pact is signed.
	September	Soviet troops occupy eastern Poland.
	November	U.S.S.R. invades Finland.
1940	March	Finns cede territory to U.S.S.R.
	August	Estonia, Latvia, and Lithuania are incorporated into U.S.S.R.
1941	April	Nonaggression pact is signed with Japan.
	June	Germany invades U.S.S.R. U.S.S.R. again attacks Finland.
1945	February	Roosevelt, Churchill, and Stalin attend Yalta Conference.

	July-August	Truman, Attlee, and Stalin attend Potsdam Conference to draft World War II peace settlements. U.S.S.R. declares war on Japan.
1947	September	Zhdanov's "two camps" speech intensifies opposition to West and leads to establishment of Cominform.
1948	March	Allied Control Commission ceases to function in Berlin.
	June	Cominform announces expulsion of Yugoslavia.
	August	Soviet blockade of land access to Berlin by French, U.S., and U.K. occupation forces becomes total.
1949	January	Council for Economic Mutual Assistance (CEMA) is created to promote intrabloc cooperation and to counteract Marshall Plan.
	February	Anti-Jewish campaign results in arrest and execution of numerous authors.
	May	Moscow agrees to lift Berlin blockade.
	September	First nuclear explosion takes place in U.S.S.R.
	October	Communist regime is recognized by U.S.S.R. as sole government of China.
1950	February	Thirty-year Sino-Soviet alliance is concluded.
1952	October	19th Party Congress (first since 1939) renames party "Communist Party of the Soviet Union" (CPSU), revises party rules, and renames Politburo "Presidium."
1953	January	Soviet doctors, mostly Jewish, are charged with plot to kill Soviet leaders on orders of Western intelligence.
	March	Stalin dies; Malenkov is named chairman of Council of Ministers and dropped from Party Secretariat, leaving Khrushchev the senior secretary.
	April	Doctors' Plot is reversed.
	June	Police chief Beriia is arrested for plotting to seize power.
	July	Korean armistice is signed.
	August	First thermonuclear device is detonated in U.S.S.R.
	September	Khrushchev is named First Secretary of CPSU.
	December	Execution of Beriia and top associates is announced.
1954	March	Central Committee approves increased grain production by "opening up virgin lands." Committee for State Security (KGB) is established.
	April-July	U.S.S.R. participates in Geneva Foreign Ministers Conference on Korea and Indochina, which concludes agreements on Vietnam and Laos.
1955	February	Bulganin succeeds Malenkov as Chairman of Council of Ministers.
	May	Warsaw Pact establishes joint command over most Soviet bloc armed forces. Austrian State Treaty is signed 15 May, ending Allied occupation. Khrushchev, Bulganin, and Mikoyan visit Belgrade to patch up Yugoslav-Soviet feud.
	July	Big Four Summit conference at Geneva attempts to facilitate solution of East-West problems in Europe.

1956	February	20th Party Congress convenes. Khrushchev denounces Stalin in secret speech.
	April	Dissolution of Cominform is announced.
	October	Khrushchev, Kaganovich, Mikoyan, and Molotov visit Poland in effort to reverse Gomulka's liberalization measures; Soviet leaders accept Gomulka measures upon being made aware of their need to prevent revolt and when assured of Poland's continued loyalty to U.S.S.R.
	October-November	Hungarian revolt is crushed by Soviet troops.
1957	February	Khrushchev's scheme for reorganization of industrial management is accepted by Party Central Committee.
	June	Majority in Party Presidium votes to oust Khrushchev, who turns the tables by appealing to Central Committee. So-called antiparty group of Molotov, Kaganovich, Malenkov, and Shepilov is then expelled from Party Presidium and Central Committee.
	October	Soviet Union launches first earth satellite. Central Committee expels Marshal Zhukov from Party Presidium and calls for tightening of party controls over armed forces.
1958	March	Khrushchev replaces Bulganin as Chairman of Council of Ministers while remaining Party First Secretary.
	September	Khrushchev proposes reform to improve Soviet educational system by increasing vocational training.
	November	Khrushchev demands termination of Western occupation rights in West Berlin.
1959	January	U.S.S.R. launches "cosmic rocket."
	January-February	21st Congress of CPSU approves Seven Year Plan and attacks "antiparty" group.
	May-August	Foreign Ministers Conference at Geneva considers problems of Germany and Berlin.
	September	Soviet moon rocket is successfully launched. Khrushchev pays official visit to United States.
	September-October	Khrushchev visits Mao Tse-tung in Peking (Peiping) "to celebrate 10th anniversary of Chinese People's Republic."
1960	January	U.S.S.R. announces plan to cut armed forces by 1.2 million.
	May	Khrushchev announces downing of U.S. U-2 plane. Big Four Summit meeting on Germany, Berlin, and disarmament canceled.
	June	Sino-Soviet dispute flares at Bucharest blocwide conference and World Federation of Trade Unions General Council session, Peking.
	July	Soviet fighter shoots down U.S. RB-47 plane over international waters; surviving crew is imprisoned.
	September-October	Khrushchev attends U.N. General Assembly in New York, caters to African nations, and demands U.N. reorganization.
	November-December	Moscow conference of Communist parties attempts to resolve Sino-Soviet dispute.

1961	January	New "heavy" ruble, equal to 10 old rubles, is introduced; new U.S. dollar rate (US\$1=0.9 rubles) implies 56% ruble devaluation.
	April	First manned space vehicle is orbited.
	June	Khrushchev meets in Vienna with President Kennedy on East-West issues.
	August	Berlin wall is built, stopping refugee flow from East Germany.
	October	22d Party Congress adopts new party program to replace one adopted in 1919 and revises party rules. Kozlov is named in second place on Party Secretariat.
1962	March	U.S.S.R. participates in 18-nation disarmament talks which open in Geneva.
	October	Soviet missiles in Cuba create crisis.
	November	Party is reorganized into virtually separate organizations for agricultural and industrial affairs.
1963	March	Government is reorganized; Supreme Council of National Economy is formed.
	April	Kozlov, heir-apparent to Khrushchev, suffers permanently disabling stroke.
	June	Brezhnev and Podgorny are added to Party Secretariat. U.S.S.R. and United States agree to establish direct teletype communication link ("hot line") between Moscow and Washington.
	August	U.S.S.R. and United States agree to ban all nuclear testing except underground explosions.
	September	U.S.S.R. begins purchase of an ultimate 12.5 million tons of wheat from abroad after disastrous year in grain and fodder production.
	October	Khrushchev launches major chemical industry program with strong accent on chemical support for agriculture.
1964	April	U.S.S.R. announces agreement to reduce production of fissionable materials for weapons.
	October	Three-man vehicle carries pilot, engineer, and medical doctor into space. Khrushchev is ousted from party and government jobs, being replaced as Party First Secretary by Brezhnev and as Chairman of the Council of Ministers by Kosygin.
	November	November 1962 party reorganization is reversed.
	December	New U.S.S.R. regime postpones—until March 1965—meeting of 26 Communist parties called for December by Khrushchev to prepare for convocation of world Communist meeting on Sino-Soviet dispute.
1965	February	Premier Kosygin visits Hanoi, Peking, and P'yöngyang in effort to heal disunity in Communist movement.
	March	Nineteen Communist parties attending "26-party meeting" postponed from December change function from formal "Editorial Commission" to "consultative" meeting but disband without agreement on date for world meeting.

		Brezhnev launches massive new program promising government support to agriculture on a scale unprecedented in Soviet history.
		Soviet cosmonaut accomplishes first "walk in space."
	September-October	Government is reorganized; national and regional councils of national economy (<i>Sovnarkhozy</i>) are abolished and pre-1957 ministerial system is reestablished; role of profit as measure of economic success is recognized.
	December	Brezhnev announced separation of party-state control functions; Nikolay Podgorny replaces retiring Anastas Mikoyan as Chairman of the Presidium of the Supreme Soviet.
1966	February	Soviet dissident writers Sinyavsky and Daniel are imprisoned for antistate activities in first such political trial of intellectuals since Stalin's death.
		Unmanned spaceship makes "soft landing" on moon.
	March	U.S.S.R. achieves first landing of probe on Venus.
	April	23d Party Congress approves directives of 1966-70 economic plan; Party Presidium is renamed Politburo; Brezhnev receives Stalin's old title of General Secretary.
	December	Brezhnev reports to Central Committee on deterioration in Sino-Soviet relations and Chinese Communist Cultural Revolution; he receives mandate to proceed with plans for an international Communist conference.
1967	March	Stalin's daughter, Svetlana Alliluyeva, defects to West.
	April	Brezhnev endorses broad united front tactics for Europe at Karlovy Vary conference of European Communist parties.
	June	Premier Kosygin seeks political settlement of Israeli-Egyptian military clash in U.N. General Assembly and in talks with President Johnson at Glassboro, N.J.
	October	Soviet Government reveals cutback of agricultural investment goals approved in March 1965; Deputy Premier Polyansky publicly dissents.
	November	Brezhnev presides over Moscow celebrations on 50th anniversary of Russian revolution.
		Consultative meetings of world's parties is called for February 1968 in Budapest to discuss future international Communist conference.
1968	January	Leading members of intellectual community protest trials of young dissidents for "anti-Soviet" activities.
	February	Budapest consultative meeting of some 60 Communist parties, without Far Eastern, Albanian, or Cuban representation, endorses Soviet call for late 1968 international conference; Romanian delegation walks out, charging Soviet use of pressure tactics.
	August	Soviet troops occupy Czechoslovakia.
1969	January	Attempt to assassinate Soviet leaders at Kremlin fails.
	March	Soviet and Chinese border troops clash on Damansky Island.
	June	International Conference of Communist Parties meets in Moscow.
	October	Sino-Soviet border talks open in Peking.

	November	U.S.-Soviet talks on strategic arms limitations open in Helsinki.
	December	Treaty on nonproliferation of nuclear weapons is deposited at United Nations.
1970	January	Moscow moves to provide air defense for United Arab Republic.
	March	Second essay by physicist Andrei Sakharov details the need for economic and political reform in the U.S.S.R. if the Soviets are to keep pace with the West.
	April	One hundredth anniversary of V.I. Lenin's birth is celebrated.
	August	Soviet-West German Renunciation of Force agreement is signed in Moscow.
1971	March-April	24th Party Congress is held in Moscow.

1. Introduction

Over a span of some 50 years the Soviet Union has developed from a backward, largely agricultural society into a modern industrial and military power capable of challenging the leadership of the United States on a number of fronts. Successive Soviet regimes have placed emphasis on enabling Moscow not only to maintain its domination over east and much of central Europe but also to extend its military and political influence to areas as distant from the Soviet heartland as Africa, the Indian Ocean, the Caribbean, and Southeast Asia.

The impressive achievements of the last half-century, however, have been costly in terms of human suffering and lives lost—most notably during the purges and the periods of collectivization and forced industrialization. Moreover, to achieve and maintain its present position, economic policy and scientific research have favored heavy industry and those scientific fields having the most direct impact on military capability. The result has been a level of living that continues to lag behind those of most industrialized nations and an uneven economic development in which agriculture and light industry fall short of those in major Western countries.

The extension of Soviet influence abroad has been adversely affected by a number of factors, chief among which are the strength and stability of the West as a whole, the bitter quarrel since 1960 with Communist China, and the growing self-assertion among Eastern European Communist nations. Moscow, once the control center of the entire Communist movement, is confronted with the erosion of its authority within the Communist camp, which includes almost 90 national Communist parties claiming an aggregate membership of 50 million, supplemented by a network of affiliated auxiliary or “front” organizations of both national and international scope. The emergence of China as a second viable Communist power center has been an important factor in reducing Soviet influence and prestige in the Communist movement and has made it more difficult for the U.S.S.R. to contain the trend toward autonomy in Eastern Europe and toward independence of foreign Communist parties elsewhere. The ability of the U.S.S.R., however, to offer substantial military, technical, and economic aid gives it an advantage in the competition with Communist China and enables it to vigorously challenge Western interests.

Moscow still considers the third world a principal arena in the contest both with the Chinese and the West and has deemphasized the creation and use of indigenous Communist parties in this area—especially in countries ruled by a one-party nationalist movement—thus masking the threat of a local

Communist takeover and creating a more friendly atmosphere for extending Moscow's influence through state-to-state relations. The U.S.S.R. also encourages Communist parties in developed countries of the West to form alliances with social democratic parties and other groups on local domestic issues in order to gain greater popular support and to help draw attention away from their Communist ties with Moscow. To insure consistency with Soviet interests, Moscow seeks—with varying success—to align the policies of these countries and parties with the foreign and domestic policies of the U.S.S.R., and through these tactics to extend its influence throughout the world.

Soviet national interests and the Marxist-Leninist ideology are basic, if not coequal, factors which determine the foreign policy of the U.S.S.R. This ideology, despite Soviet tactical shifts from belligerence to détente and from increased pressure to accommodation, has always held that the Communist and capitalist systems are essentially irreconcilable and that communism will eventually triumph, although conceding that the struggle will continue for some time. A fundamental concept of Soviet ideology, advanced by Nikita Khrushchev in the 1950's, has been “peaceful coexistence,” which the regime has used to rationalize its conduct of a policy of cooperation with the West while continuing the traditional aim of dividing, subverting, and weakening non-Communist nations by all means short of war. Development of the U.S.S.R.'s foreign policy on the basis of even limited collaboration with the ideological enemy tended, during Khrushchev's rule, to increase significantly the antagonism between the U.S.S.R. and the Chinese People's Republic, whose leaders insist on uncompromising hostility toward the West. The present Soviet leadership, in vying with the militant Chinese Communists for the support of other Communist parties, has tried to avoid the taint of charges of collaboration with “imperialists.” As a result, while the regime continues to take advantage of the ideologically acceptable idea of “peaceful coexistence” whenever it serves national interests to do so, the definition of the term has been narrowed to allow for greater militancy in the U.S.S.R.'s policy toward the West.

The Soviet Union controls, directly or indirectly, most of the resources of Eastern Europe and dominates important strategic areas—the Polish plain and most of the Danubian basin. The economies of the Eastern European Communist nations have remained closely linked to the economy of the U.S.S.R., and the Soviet Army's harsh suppression of the Hungarian revolt of

1956 as well as the Soviet occupation of Czechoslovakia in 1968 serve as examples to would-be separatists. Romania, however, cautiously continues its efforts to pursue a more independent foreign policy and to lessen its economic dependence on the U.S.S.R. and the Warsaw Pact countries.

The U.S.S.R. has expanded the Soviet system by imposing it on the Eastern European nations, principally through military occupation after World War II, and by supporting regimes of similar orientation in the Communist-dominated areas of Asia as well as in Cuba. Although the Soviet system is ruthless and cumbersome, some leaders in former colonial areas believe that, to varying degrees, it provides a model for the planning and authority needed to catapult an underdeveloped nation into the 20th century. Soviet economic aid programs are underway in a number of less developed nations of the non-Communist world. In many countries in Asia and Africa, the U.S.S.R., through the extension of long-term credits and the provision of technical assistance, has established itself as a major participant in ambitious plans for economic development. Concomitantly, the U.S.S.R. has become a primary source of aid for modernizing and expanding the military establishments of Afghanistan, Algeria, Syria, the United Arab Republic (U.A.R.), Iraq, Cuba, and India, and is maintaining its economic offensive among the newly independent peoples of Africa and the leftist "national revolutionary movements" of Latin America. Despite its interest in extending Soviet influence in the third world, the present regime has become more cautious in granting economic aid unless there is some certainty that the Soviet Union will also reap clear political or economic benefits. Domestic economic problems plus the failure in the past of grandiose, Soviet-funded projects to bring a rapid increase in Soviet political influence—as for example in Indonesia—probably account for Moscow's new circumspection with regard to foreign aid.

An elaborate system of controls has been maintained to perpetuate within the state the dominant position of the Soviet Communist Party, to shape public opinion, and to neutralize popular discontent. Some of the more brutal repressive measures which characterized Stalin's rule have been eliminated by his successors in their efforts to stimulate individual initiative and to encourage the people to identify themselves with the regime. The ameliorative efforts have not been entirely successful and disaffection and dissidence have increased among important elements of Soviet society, most notably among the intelligentsia. The Soviet leadership has reacted in its domestic policy by a reemphasis on "orthodoxy."

Despite the immensity and topographic variety of the U.S.S.R., less than one-eighth of the country is arable and a great part lies too far north for any but Arctic type habitation. In many areas where the climate is good the soil is poor, and some of the most fertile land lies in regions of inadequate precipitation or where the

growing season is short. Likewise, many of the abundant and varied raw materials in the U.S.S.R. are unfavorably located and hard to exploit. Most of the great rivers run to frozen or land-locked seas, and some flow in part through regions unsuited to settlement. The U.S.S.R. covers a large part of Europe and Asia, and its population has ethnic, religious, and historical ties with both. It has more people than any Western nation, and a sizable number are skilled in modern industrial techniques. Scientific achievements are high, but administrative and managerial skills are less well developed.

The virtual abolition of private ownership of the means of production, the direction of economic development through a comprehensive and detailed economic plan, and the collectivization of millions of peasant farmers have been the foundations of a new society which its leaders maintain is superior to societies based on private enterprise. The Soviet economic system, however, has fallen far short of meeting the growing needs of the country's people. Although there has been some improvement in recent years, per capita production of consumer goods is low compared with that of Western industrial countries, and the diet is qualitatively poor by Western standards. Despite spectacular space accomplishments and high industrial growth rates, the country has a backward agriculture, many antiquated factories, underdeveloped services, and, by Western standards, relatively poor living conditions. Nevertheless, the leaders of the U.S.S.R. have created an integrated state which has survived a number of severe crises and have developed an economy which has become a tremendous force with worldwide impact.

The regime regards its military establishment as a major instrument for sustaining and augmenting its position in the struggle against the capitalist world and as an outstanding example of the success and invincibility of its social system. The number of men under arms was reduced between 1960 and 1964, but in the period since the ouster of Khrushchev the downward trend was halted, and there has been a slight increase in military manpower. Throughout this period, the Soviet leadership has had the basic aim of maintaining and improving balanced military forces able to resist a Western attack on short notice, as well as to insure ultimate victory, and the resources needed to implement this policy are given priority consideration. Since 1965 the regime has significantly expanded its military forces along the Chinese border and views its military strength there as an integral element in "containing" China.

The U.S.S.R. sees military power as serving two basic purposes: defense of the Soviet system and support for expansion of its influence, making one of the most important objectives of Soviet military policy the deterrence of the West while the government conducts its foreign policy and subversive activities by all means short of open commitment of Soviet forces. Military power is sometimes brought into play in direct support of Soviet political demands through the threat of force,

through the respect for the Soviet state and its Communist system engendered by its growing power, and through the military aid and support rendered to allies, to neutral but friendly states, and to anti-Western movements.

Military strategy is also influenced by economic, technological, and geographic factors. Soviet military requirements have been a primary motivation for sustained and strenuous effort to increase economic strength and for high priorities for technological developments. Economic and technological advances have, conversely, influenced military thinking. Recent economic and technological achievements have facilitated the development of a more diversified armed force in place of one that has historically emphasized ground forces. Ground forces continue to play a vital role in Soviet armed power, but increased capabilities for air and naval warfare permit a more flexible military strategy, as illustrated by the presence of a strong naval force in the Mediterranean for the first time.

The public Soviet position has long been that the world balance of forces is shifting in favor of "world socialism." Undoubtedly the Soviet leaders now see the advance of Soviet military power—from progress toward nuclear parity with the United States to global

expansion of the Soviet navy—as a key component of this process. A measure of greater Soviet assertiveness may well accompany this growth of power. At the same time, however, Soviet actions regarding the Vietnam war, during the Cuban missile crisis of 1962, and in the Middle East crises of 1967 and 1970 provide solid evidence that the U.S.S.R. recognizes the grave dangers posed by a direct confrontation with the United States and will act to avoid such a confrontation.

Consciousness of Soviet power has by no means diminished the awareness of the danger of a nuclear confrontation in the Soviet policymaking outlook, particularly in view of apprehension over the future development of mainland China. But the degree of caution Moscow displays will probably be tied importantly to the U.S. attitude and capabilities in any given situation. Unrequited concessions on major East-West issues are not to be expected from Moscow, even if urgent domestic requirements for economic and technological progress impose certain restraints upon Soviet foreign policy, especially in Europe. The Soviet response to the U.S. statement of willingness to move toward an "era of negotiation" remains to be seen; that response will probably emerge on a case-by-case basis with differing content in different regions.

2. Geography

A. General

The U.S.S.R., the largest country in the world, extends across much of Europe and all of northern Asia (Summary Map, Figure 186). It is bordered mostly by the broad North European Plain in the west and by an almost continuous mountain bulwark in the south; the Pacific and Arctic Oceans are to the east and north. The western border of the U.S.S.R. is within 1,000 nautical miles of all the important manufacturing centers in Western Europe; the southern border is within 750 nautical miles of the extensive oilfields of the Middle East; the easternmost extremity is within 750 nautical miles of the principal U.S. bases in Alaska. Moreover, within 4,000 nautical miles of the northern coast, across the Arctic Ocean, are the major industrial regions of North America—all within range of Soviet jet bombers and missiles. The country is unfavorably located in relation to the major sea lanes of the world, and only a few widely scattered ports are open throughout the year.

One geographic factor overshadows all others in characterizing the Soviet Union: its enormous size. The U.S.S.R. is approximately 300,000 square miles larger in area than the combined land areas of the United States, Canada, and Greenland (Summary Map inset, Figure 187). Its 8.6 million square miles occupy almost one-sixth of the land surface of the earth. This vast area spans 170° of longitude across the northern part of the Eurasian continent, from the Baltic Sea in the west to the Bering Strait in the east. Continental North America, by comparison, spans only 111° of longitude. This great longitudinal extent of the U.S.S.R. landmass measures about 5,550 miles¹ by air from Kaliningrad to the Bering Strait via Moscow, Tomsk, and Yakutsk. Between the southernmost point (approximately 35°N.) of the continental U.S.S.R. on the Afghanistan boundary and its northernmost point (77°N.) on the Taymyr peninsula is a spread in latitude comparable to that from Chattanooga, Tennessee, to Thule, Greenland. Soviet Arctic insular possessions extend to 82°N. (Franz Josef Land). About 80% of the U.S.S.R. is north of 50°N., the latitude of Winnipeg, Canada.

About 244 million people, roughly one-sixth more than the population of the United States, live in this enormous expanse of land. Approximately three-fourths of this population is concentrated west of the Ural Mountains in the European U.S.S.R., where most of the great urban centers and the best developed transporta-

tion networks are located. With the expansion^{25X1} of industry and agriculture, the population of the U.S.S.R. has been increasing in Siberia and in the Arctic.

1. Topography

The surface of the U.S.S.R. is dominated by interior plains and plateaus drained by great rivers, the largest of which flow south in the European U.S.S.R. and north in Siberia. The area is rimmed on the south and east by a succession of mountain systems. Plains, broken at wide intervals by hills and low mountains, predominate in the western half of the country. These plains comprise four major zones from north to south: tundra, forested swampy plains, cultivated plains, and grass- and scrub-covered plains and deserts.

The first, along the shores of the Arctic Ocean, is a zone of desolate tundra (Figure 1), characterized by arctic vegetation and permanently frozen subsoil (permafrost). Along its southern margin, where the tundra supports some tree growth, it merges with a second zone, a broad belt of densely forested swampy plains (taiga) (Figure 2). These forested plains extend from near the Arctic Circle southward to about 55°N. Movement is extremely difficult through these immense forested swamps, which is an important reason for the sparsity of urban centers in the zone. Natural openings and clearings prevalent near the southern boundary of the forest zone are outliers of the third zone—well-drained cultivated plains (Figure 3) and widely scattered forests of mixed evergreen and deciduous trees. These plains extend westward beyond the borders of the U.S.S.R. along the Baltic and North Sea coasts to France and have been the obvious and traditional avenue for military movement during the last thousand years. Most of the Soviet population, the most productive industries and agricultural areas, and the best developed transportation net are concentrated in these plains. South of the cultivated plains is the fourth zone, grass- and scrub-covered plains and deserts (Figure 4), which occupies an area more than half as large as the United States. Most of this zone is east of the Caspian Sea and south of about 50°N. Centers of population in these plains and deserts are widely scattered and linked by a sparse network of railroads and mostly poor roads.

A plateau area cut by deeply incised river valleys is between the Yenisey and the Lena rivers. The surface of the plateau, although higher than the swampy plains in the west, resembles them in the relatively uninterrupted expanses of dense, swampy coniferous forest. Movement

¹Distances are in statute miles unless nautical miles are specifically stated.

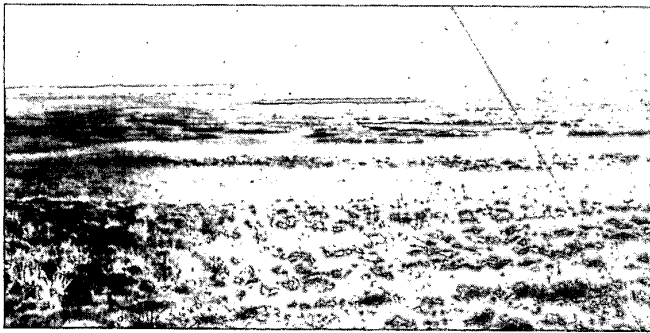


FIGURE 1. Sandy knolls and peat bogs of the Arctic tundra

25X1



FIGURE 2. The densely forested swampy Siberian taiga

25X1



FIGURE 3. Tilled field on collective farm near Kiev

25X1



FIGURE 4. Sand dunes and scrub vegetation in the Karakum desert

25X1

in this area is severely restricted. Surface transportation routes north of the Trans-Siberian railroad are very sparse except for trails and inland waterways. This part of Siberia has one of the lowest population densities in the U.S.S.R. The largest concentration of people is around Irkutsk near Lake Baykal.

2. Climate

The U.S.S.R., in general, has a continental climate. The predominant influences on the climate are the vast Eurasian landmass and the adjacent or nearby oceans and seas. Winters (principally December through February) vary from cool in some Black Sea regions to extremely cold in much of Siberia, where an absolute minimum near -95°F . has been recorded. Summers (June through August) vary from cool on the Arctic coast to hot in the southern desert regions, where absolute maximums near 115°F . have occurred (Figure 5). Annual precipitation averages less than 20 inches over most of the U.S.S.R. and ranges locally from less than 5 inches to more than 40 inches. Winter precipitation is mostly in the form of frequent light snows which cover most of the surface throughout this season. Occasional blizzards last for several days and disrupt most operations. Showers account for the greatest monthly amounts of summer precipitation at most places. Thunderstorms occur predominantly in summer; they are most frequent in June and July, when they occur on 6 to 12 days per month in the southern mountains and 4 to 6 days per month elsewhere, except in the Arctic regions where they are infrequent.

Relative humidity varies from extremely high along the Arctic coast all year to low in the southern desert regions during the summer. Except along the Arctic coast diurnal and seasonal variations are significant, and most locations have high early morning values and lower afternoon values. Seasonal maximums of relative humidity normally occur in summer along the Pacific coast and at some locations near large lakes. By contrast, most interior locations have winter maximums.

Cloudiness is generally at a maximum in summer and early autumn and at a minimum in winter and early spring over much of Siberia and the Arctic regions of the European U.S.S.R. The opposite is true over much of the remainder of the country. Greatest cloudiness, generally 65% to 90% in summer and 45% to 65% in winter, occurs along the Arctic and Pacific coasts; least cloudiness, generally 40% to 60% in winter and 10% to 40% in summer, occurs in the southern deserts and semidesert areas.

In general, poorest visibilities occur during the colder months and best visibilities during the warmer months. However, along the Arctic and Pacific coasts, visibilities during summer may be poor because of fog. Chief restrictions during the colder months are falling and blowing snow, fog, ice fog in northern sections, and haze and smoke near cities and industrial areas. Summer restrictions are fog, heavy rain, and, in southern desert regions, duststorms.

Surface winds over most of the U.S.S.R. normally are directed away from central Siberia in winter and toward southern Asia in summer. Winds are generally strongest in winter, when gales (wind speed equal to or greater than 28 knots) occur on 10 or more days per month on the Arctic coast and only 1 or 2 days per month in parts of the Caucasus.

B. Military geographic regions

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The U.S.S.R. contains such a wide range of environmental conditions that broad generalizations have been used in defining military geographic regions for the country. Significant factors used to distinguish the various military geographic regions are relief, drainage, vegetation, climate, and coastal influences.

Differences in these factors in the Soviet Union are sufficiently marked to provide a basis for dividing the country into seven military geographic regions: the Central Plains, the Caucasus Mountains, the Caspian-Central Asian Lowlands, the Southern and Eastern Mountains, the Subarctic Swamp and Forest, the Arctic Barrens, and the Insular and Peninsular Far East (Figure 6). The most important region, both economically and strategically, and the most favorable for sustained large-scale military operations, is the Central Plains region.

1. Central Plains

This region, which contains most of the population, industry, and transportation network of the U.S.S.R., extends from the western borders of the Soviet Union eastward for about 2,700 miles into Siberia. The region is composed mostly of sparsely forested plains which are dissected by major north- or south-flowing rivers. The plains are interrupted in their central section by the narrow, relatively low Ural Mountains. Relatively small mountainous areas are also located in the southwest on the border with Romania and near Sevastopol' on the Black Sea.

Because of its physical characteristics and its industrial and cultural development, this region is the part of the Soviet Union most generally suited for large-scale conventional ground operations. Cross-country movement is difficult in parts of the west and northwest because of extensive marsh and forest areas, and in the relatively small mountainous areas where vehicles would be confined to existing lines of transportation. Movement in the remaining parts of the Central Plains is fair to good but is greatly influenced by several seasonal factors.

Heavy rains and melting snow from as early as late February in the south and lasting until mid-May in the north cause the ground to become deep mud, making cross-country movement very difficult. Severe cold and snowfall from late October to mid-April impose great hardships on troops. Mean daily minimum temperatures of -50°F . and snow as deep as 3 feet have been recorded in this region. Although winter may force a marked slowdown in military operations, it may

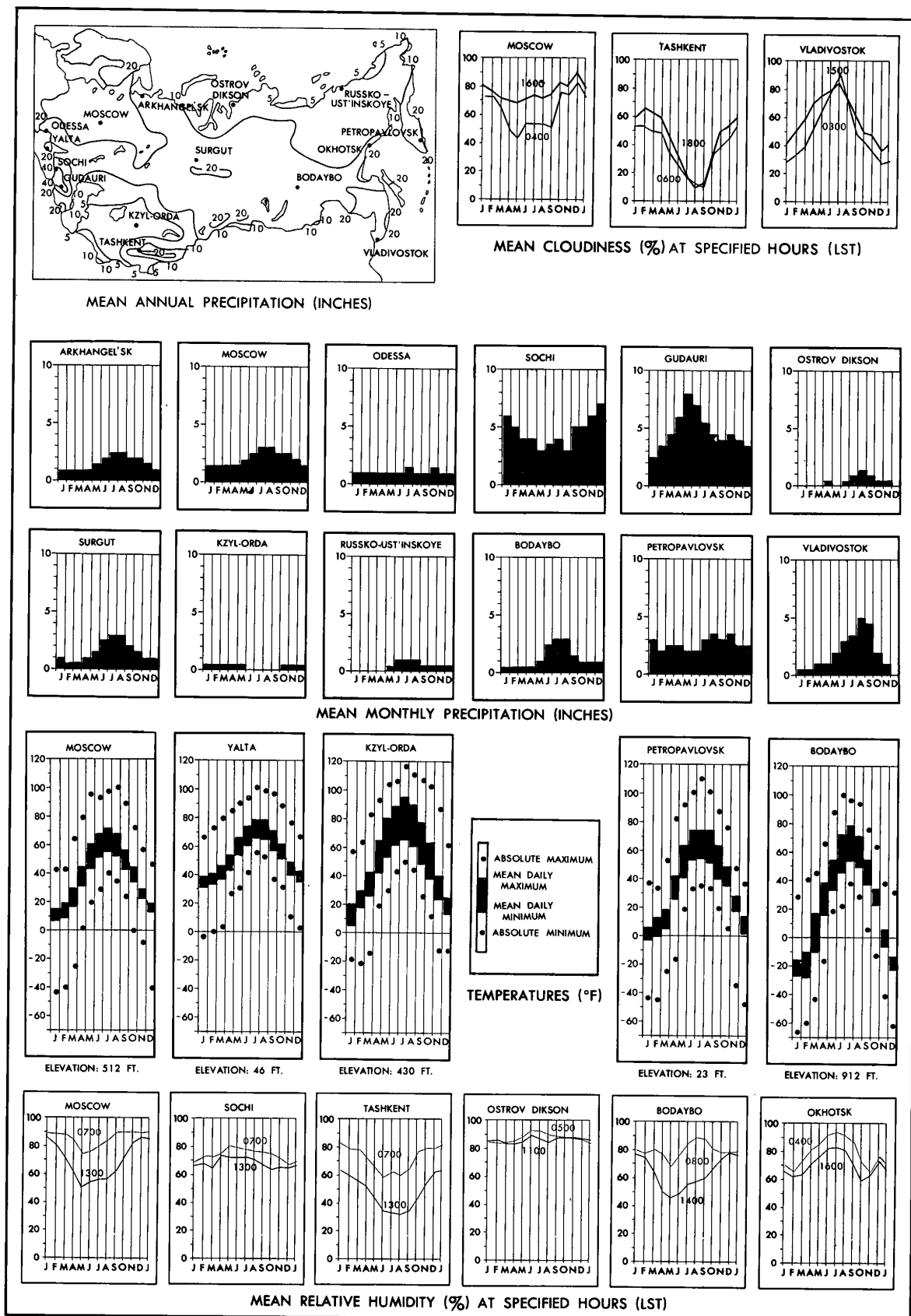


FIGURE 5. Cloudiness, precipitation, temperature, and relative humidity

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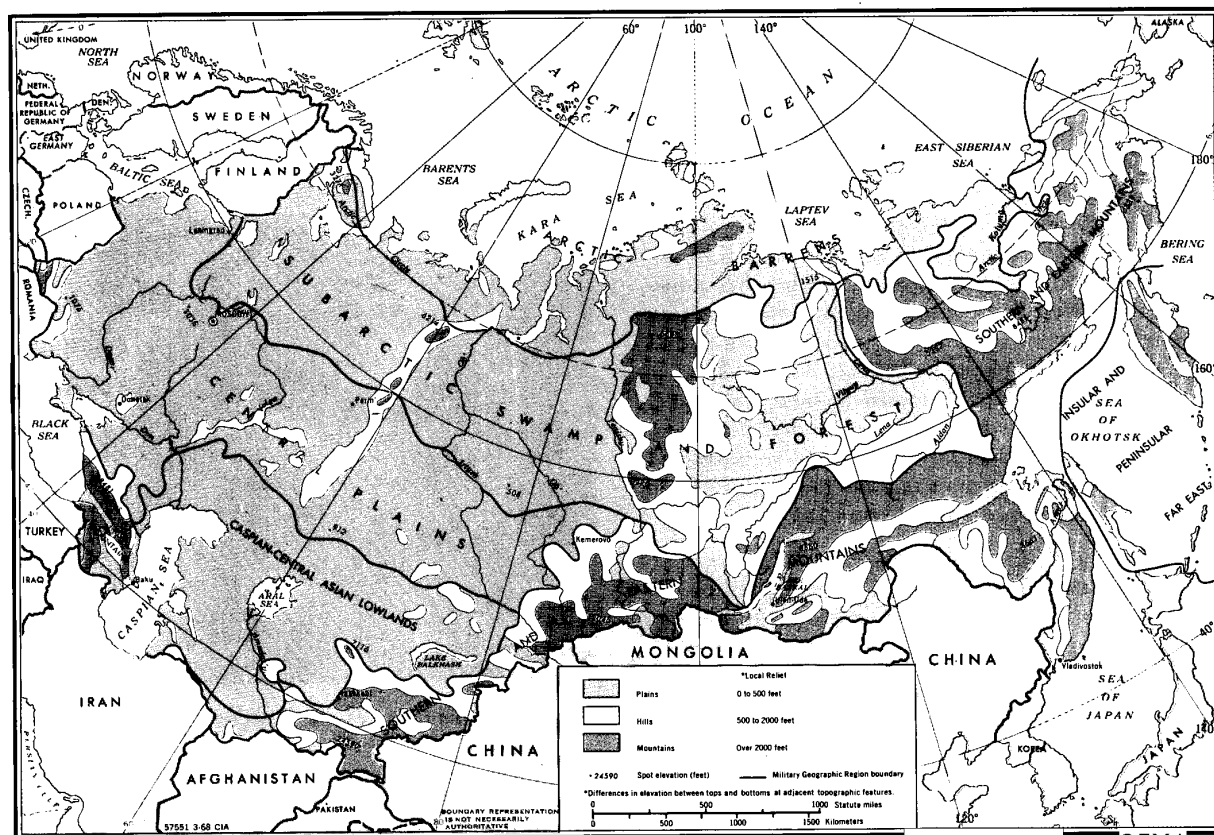


FIGURE 6. Generalized military geographic regions and terrain

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facilitate movement in one important respect: rivers generally freeze to sufficient depth to support light vehicles and, in some places, tanks.

Military operations would be facilitated by the best developed highway and railroad network in the Soviet Union. This road and rail system is supplemented by a system of navigable rivers and canals. Construction of new roads would encounter major problems throughout much of this region.

Concealment and some cover would be available in the fairly extensive forested areas in the northern part of the region and on the forested slopes of mountainous areas. Elsewhere, natural cover and concealment for large numbers of mechanized forces are sparse, though small villages throughout the region could provide cover and concealment for small numbers of troops. Extremely dry periods during summer months make vegetation and grasses readily combustible. The region is moderately well suited for bunker-type construction except in large, poorly drained areas in parts of the west and northwest and in western Siberia.

The Central Plains region is well suited for airmobile and airborne operations during the months of June through September. Numerous sites are available for parachute, helicopter, and assault-type aircraft landings, which would require little or no site

preparation. Several reservoirs and large rivers would also be suitable for landing water-based aircraft. Construction of airfields would be relatively easy on the plains except in parts of the west and northwest, where sites are limited in size, number, and alignments by numerous marshes, swamps, and lakes. In many places, little grading would be required and runway lengths and alignments would be unrestricted. Construction material, except hard rock suitable for crushing, is generally available. Mirey ground or extreme cold during much of the rest of the year would adversely affect the performance of men and equipment.

The coast is mostly unsuitable for amphibious operations because of partly obstructed nearshore approaches, rugged coastal terrain, areas of marsh, and poor exits. Although there are numerous landing beaches along the coasts of the Baltic and Black Seas, the most suitable areas for large-scale landings are in the vicinity of Riga on the Baltic Sea and near Odessa, Yevpatoriya, and Feodosiya on the Black Sea. In winter, however, these beaches are generally obstructed by ice from late November through April in the Baltic Sea and early December to late March in the northern part of the Black Sea. In the Baltic Sea, offshore approaches are generally clear, but nearshore approaches are partially obstructed by rocks or shoals. Nearshore bottom slopes off the beaches range from flat to steep but are mostly

flat. Bottom materials generally are sand and mud, with rocks and clay off several beach areas. Beaches range from 1,200 yards to 19 1/4 miles (the majority are up to 4 miles) in length, and beach material is sand which is firm when wet and soft when dry. Exit inland is mainly by tracks and trails to nearby surfaced or unsurfaced roads. In the Black Sea, offshore approaches are generally clear, but nearshore approaches are partly obstructed by shoals, rocks, and reefs except off the south coast of the Crimean Peninsula where they are clear. Nearshore bottom slopes off the beaches range from flat to steep, but the majority are gentle. Bottom materials generally are sand and mud, with gravel and shell off several beach areas. Beaches average about 1 mile in length and are composed of sand and gravel which is firm when wet and soft when dry. Exits from beaches are by tracks and trails to nearby surfaced and unsurfaced roads. The most feasible landing areas are shown on the Summary Map, Figure 186.

The Central Plains region is fair to poor for irregular force operations. The relatively flat nonforested plains would offer little to no cover or concealment, but the forested slopes of the Ural and Carpathian Mountains would provide cover and concealment for small groups. Bogs and swamps in the west and northwest make movement on foot difficult but do offer some cover and concealment for small groups. Conventional force operations would be very difficult in the bogs and swamps. The relatively well developed road network would aid the movement of conventional forces, to the detriment of irregular force operations. Sustenance would be available on the cultivated plains but scarce in mountain regions.

2. Caucasus Mountains

This region is composed mostly of two northwest-southeast-trending mountain ranges which contain many peaks over 15,000 feet above sea level (Figure 7). These high, rugged, partially forested, sparsely populated mountains are drained by north- or south-oriented, deeply incised, rapidly flowing streams and are divided by relatively narrow, densely populated, cultivated valleys.

The Caucasus Mountains region is, for the most part, unsuited for large-scale conventional ground operations. Steep mountain slopes would preclude vehicular cross-country movement except in the valleys between the two major mountain ranges. Operations could be conducted best by troops trained in mountain warfare. Cold weather during winter months would be an additional handicap to troops operating in the mountains; January mean daily minimum temperatures as low as 6°F. have been reported. Snow cover generally lasts from late October to early April.

The principal roads in the region follow the coasts and extend east-west via the valleys which separate the two major ranges. Several roads, which can be easily



FIGURE 7. Main range of the Caucasus Mountains 25X1

blocked, traverse the mountains from north to south. Although construction materials are plentiful, the construction of new roads would be extremely difficult in most places because of steep slopes.

Forests, most extensive in the west and on lower slopes, and surface irregularities would afford cover and concealment for troops operating in the mountains. However, in the valleys which separate the major ranges, natural cover and concealment are generally poor. Much of the region is well suited for the construction of tunnel-type installations, but access to sites is difficult. Most parts of the valleys are favorable for bunker-type installations.

The region is not suited for airmobile and airborne operations. High, rugged relief would be an obstacle for low-level air approaches to most parachute drop and helicopter landing sites except in the valleys separating the two major mountain ranges. Steep slopes also preclude airfield construction in most of the area. However, there are some sites suitable for airfields in the valleys separating the two mountain ranges; approaches and runway orientations would be generally unrestricted.

Rugged terrain along much of the Black Sea coast makes most of this region unsuitable for large-scale amphibious operations. There are, however, amphibious landing areas on the eastern part of the Black Sea coast. Approaches are clear, beaches long, and exits inland to coastal roads and railroads favorable.

The Caucasus Mountains region is well suited for irregular force operations. Rugged, densely forested

slopes offer cover and concealment for small groups. Developed transportation facilities are poor, and the existing roads can be easily blocked. The valleys are cultivated and more densely populated, and may afford some food, clothing, and shelter. Natural cover and fuel would be available in the mountains. In winter, low temperatures would hinder irregular force operations.

3. Caspian-Central Asian Lowlands

This lowland region is mostly east of the Caspian Sea and extends eastward for a maximum distance of about 1,800 miles. The region consists of arid and semiarid sparsely populated plains where only six major rivers, in an area covering over 1 million square miles, have sufficient supplies of water to sustain flow throughout the year.

The Caspian-Central Asian Lowlands are unsuited for large-scale conventional ground operations in almost every aspect except cross-country movement. The greatest problem would be overcoming the almost complete absence of an adequate water supply throughout most of the region. Only in the southeast, adjacent to the Southern and Eastern Mountains region, is sufficient water available through the year. Ample supplies are also available from mid-March to mid-June in the extreme north. The paucity of roads and railroads for movement of men and materiel would add to the problems of military operations. Only five railroads cross the region from north to south, and paved roads are almost nonexistent. The insufficiency of both water and construction materials would make construction of transportation facilities difficult. Troops operating in the region would also be handicapped by the scarcity of natural cover and concealment. Other natural conditions, however, favor the construction of bunker-type installations except in the areas of sand dunes in the south and in hilly areas in the northeast. In the hilly areas, natural conditions are moderately well suited for the construction of tunnel-type installations.

Troops operating in the area would be subject to a wide variation in temperature between summer and winter. Mean daily maximum temperatures in July range from the low 80's to the upper 90's. In January, mean daily minimum temperatures range from slightly below zero to the lower 30's.

Although the terrain of most of the Caspian-Central Asian Lowlands favors airmobile and airborne operations and contains numerous sites for landing of assault-type aircraft, troops dropped in the area would experience the same unfavorable conditions that would be encountered by large-scale ground operations. Construction of airfields throughout most of the area would be seriously handicapped by the lack of water, construction materials, and good natural foundations.

The region is unsuited for large-scale amphibious operations because it has no approaches from the open sea.

The Caspian-Central Asian Lowlands are poorly suited for irregular force operations. The flat, semiarid, sparsely populated plains offer little to no cover or concealment, and the scarcity of water would be a constant problem. There are very few roads and railroads, but the good conditions for cross-country movement of conventional forces would be detrimental to operations of irregular forces. Natural cover, fuel, and sustenance would be scarce.

4. Southern and Eastern Mountains

This region, the largest in the U.S.S.R., extends for 6,000 miles from the Caspian Sea in the southwest to the Bering Strait in the extreme northeast. This sparsely populated region consists, for the most part, of rugged mountains (Figure 8), which contain a variety of terrain features. The mountains along the Iran border in the west are arid and barren. Those along the Afghanistan border are sparsely forested and are drained by numerous rapidly flowing, deeply incised streams. These mountains contain the highest peaks in the U.S.S.R. and are the site of extensive glaciers and snowfields. Farther east, along the Mongolia border west of Lake Baykal, the mountains are more densely forested and peaks are lower. The region east of Lake Baykal is less rugged; mountain ranges there present varied patterns of shape, height, and direction and are more frequently separated by broad, nearly level valleys than are the ranges in the west.

This region is mostly unsuited for large-scale conventional ground operations. Steep slopes preclude vehicular cross-country movement. East of Lake Baykal, the region is crossed by the vital Trans-Siberian railroad, which connects the Central Plains region to important population centers on the Pacific coast and along which most of the region's population is located; however, operations would be handicapped by the almost complete absence of a road and railroad network. Steep slopes in most of the region would make construction of transportation facilities very difficult. Good cover from small arms fire and concealment from observation is afforded by the forests; irregularities in relief may give good cover from flat-trajectory fire. Most of the region is moderately to well suited for the construction of tunnel-type installations. Many valleys and basins are poorly suited for bunker-type installations because of poor drainage. In addition to rugged relief and the paucity of roads and railroads, troops operating in this area would be subject to extremely cold winter temperatures. Temperatures in the interior are among the coldest in the world. At Verkhoyansk a low of -94°F . has been recorded; in the mountains west of Lake Baykal a low of -59°F . has been recorded.

The region is unsuited for airmobile and airborne operations. Steep slopes preclude parachute drops and landing of helicopter and assault-type aircraft in most localities. Marshy terrain is a hindrance in the larger

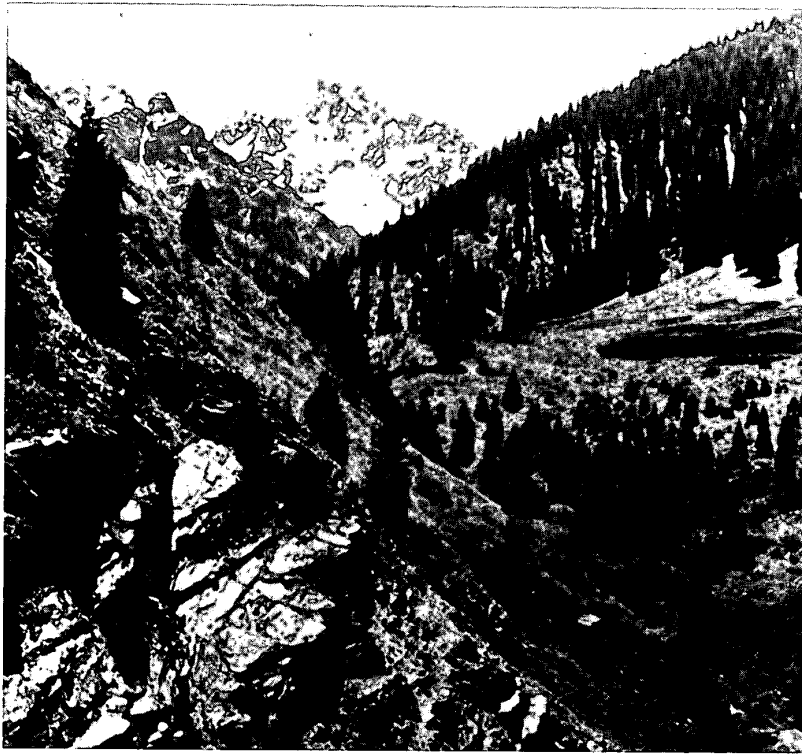


FIGURE 8. Rugged, partially forested slopes in the Tien Shan Mountains

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valleys and basins. The surrounding high relief is an obstacle for low-level approaches to these valleys and basins. Steep slopes preclude airfield construction in most of the region, and, in many basins and valleys, airfield construction would be hindered by poor drainage.

The rugged relief which extends along most of the Pacific coast is generally not suitable for amphibious operations. There are, however, suitable landing areas that afford access to Vladivostok and Nakhodka. Approaches are generally clear with the exception of rocks in the nearshore approach. The beaches are composed of sand and gravel and are firm. Exits inland are by tracks and unsurfaced roads to a nearby surfaced coastal road.

The Southern and Eastern Mountains region is well suited for irregular force operations. The rugged, densely forested mountains in the south offer good cover and concealment. Mountains in the east are less rugged but also offer good possibilities for undetected movement and cover. This region is characterized by extremely cold temperatures and by an almost complete absence of a road and railroad network. Cultivated and natural foods are very scarce, and supplying irregular forces by sea or air would be difficult.

5. Subarctic Swamp and Forest

This sparsely populated region, which stretches eastward about 3,500 miles from the border of Finland

to the mountains east of the Lena river, consists of heavily forested, poorly drained plains and highlands which are dissected by large, north-flowing rivers. That part of the region west of the Yenisey river consists almost entirely of plains except for a relatively small area of hills in the northwest and the Ural Mountains, which bisect the region in the vicinity of the 60th meridian. East of the Yenisey river the Central Siberian Plateau is hilly with a large flat to dissected plain near the Lena river. A large area of mountains is located just east of the Yenisey river.

The Subarctic Swamp and Forest region is poorly suited for large-scale conventional ground operations. Though much of this region is relatively flat, movement of troops and vehicles is either highly restricted and channelized or is practically impossible because of flooded or soft ground, marshes, deep streams, and locally rugged terrain. From mid-October through April, frozen water features and ground may aid movement provided snow cover is not greater than 1 ½ feet deep. Steep slopes are additional obstacles to cross-country movement in the Ural Mountains and the hilly to mountainous Central Siberian Plateau.

Another deterrent to military operations is the almost complete absence of a road and rail network. Three railroads cross this region from north to south, west of the Urals. These run from Murmansk, Arkhangel'sk, and Vorkuta southward into the Central Plains region. Construction of additional transportation facilities

would require extensive clearing and drainage, and alignments would be restricted by steep slopes in the Ural Mountains and the Central Siberian Plateau.

Good cover from small arms fire and concealment from observation is afforded by the dense forests; steep slopes and rugged terrain in the hilly and mountainous areas give good cover from flat-trajectory fire. The poor drainage makes much of this region unsuited for the construction of underground installations.

The severe subarctic climate compounds the handicaps imposed by the swampy, forested terrain. The extremely low temperatures would severely reduce the efficiency of troops. Yakutsk on the Lena river has a January mean daily minimum temperature of -53°F . West of the Yenisey river, temperatures, although less extreme, are near or below 0°F . for long periods.

This region, for the most part, is unsuited for airmobile and airborne operations. Although air approaches are generally unrestricted, except from the east, the dense forests and extensive swamps would be extremely hazardous for troops dropped into the area. Construction of airfields would be difficult and would require extensive clearing and drainage.

The region borders the White Sea for a short distance in the northwest, but conditions there do not favor large-scale amphibious operations. The shores are normally blocked by ice between mid-November and mid-May.

The Subarctic Swamps and Forests region affords good to fair conditions for irregular force operations. Dense forests throughout this region afford good concealment and cover from small arms fire; the more rugged terrain in the Ural Mountains and the Central Siberian Plateau affords good concealment and very good cover from flat-trajectory fire for small groups. Sustenance, such as cultivated or natural foods, shelter, and clothing would be very scarce. The severe subarctic climate would be a hindrance to irregular force operations.

6. Arctic Barrens

This region, which lies mostly north of the Arctic Circle, extends approximately 3,500 miles along the coast of the Arctic Ocean from the borders of Finland and Norway in the west to the Kolyma river in the east. Most of the Soviet islands in the Arctic Ocean are included in the region. The mainland part of the region is a sparsely populated plain drained by large north-flowing rivers and is covered for the most part by tundra vegetation. However, the plains are interrupted in the west by the Ural Mountains and by scattered hilly and mountainous areas. Many of the islands in the Arctic Ocean are also hilly, and glaciers and snowfields cover about half their areas.

This region is poorly suited for large-scale conventional ground operations. Troops would be

subjected to the climatic extremes characteristic of high latitudes. Conditions are especially severe during the long, extremely cold winters, which last from early October through March. Winter darkness and frequent storms make visibility extremely poor. Winter temperatures usually remain below 0°F ., and temperatures as low as -75°F . have been recorded in the east. In summer, when mean daily minimum temperatures in July and August range mostly between 40° and 60°F ., the ground thaws and makes vehicular movement extremely difficult. Another handicap to ground operations is the almost complete absence of improved roads or railroads to facilitate the movement of troops and supplies. Although relief presents few problems to road or railroad construction, the presence of permafrost in most of the region and the poor drainage during the summer make construction of these facilities very difficult. The low-growing vegetation affords no cover and little concealment. The presence of permafrost would be a handicap in the construction of bunker- and tunnel-type installations.

Although the relief and vegetation of the region favor airmobile and airborne operations, such operations would encounter the same severe arctic climate factors that would adversely affect ground operations. Similarly, airfield construction would be hindered by the same problems encountered in railroad and road construction, principally permafrost and poor summer drainage.

The region is not suited for amphibious operations. Except along the coast of the Kola Peninsula on the Barents Sea, which is generally ice-free throughout the year, shores are ice-free only from August through September or mid-October. There is one landing area northeast of Murmansk suitable for large-scale amphibious operations. Offshore approaches are clear; nearshore approaches are partly obstructed by sandbars. The beach material is sand, which is firm when wet and soft when dry. Exits inland are cross-country or by trails to a minor port.

The Arctic Barrens offer fair conditions for irregular force operations. The flat, sparsely vegetated plains offer little to no cover or concealment. Long, dark winters, deep snow, and extreme cold would present difficulties to irregular forces. Mire conditions in the summer months would practically preclude the movement of conventional forces on the ground. This barren land offers little or no sustenance, but the flat plains would allow supplies to be brought in by air.

7. Insular and Peninsular Far East

This region consists of the Kamchatka Peninsula, Sakhalin island, and the Kuril Islands. The Kamchatka Peninsula and Sakhalin each have two generally parallel forested mountain ranges drained by short, rapidly flowing, incised streams. These mountain ranges are separated by marshy or swampy plains.

Marshy plains are also common along the coasts and on northern Sakhalin. Most of the Kuril Islands are mountainous.

The rugged relief that comprises most of this region is unsuited for large-scale conventional ground operations. Steep slopes preclude vehicular cross-country movement in most of the region. In the plains, marshes and swamps are the principal deterrents to vehicular movement. Military operations could be conducted best by troops trained in mountain warfare. The paucity of roads and railroads would add to the difficulties of troops operating in the region. Hard-surfaced roads are few and there are only two major railroad lines (3'6" gage) in Sakhalin. Construction of additional transportation facilities would be extremely difficult on steep mountain slopes and on the poorly drained areas that cover most of the plains. The forests and irregularities of relief afford cover and concealment in mountainous areas. Natural cover and concealment would be generally lacking on the plains. The region is well suited for the construction of tunnel-type installations in the mountains; most of the plains are unsuited for bunker-type installations because of poor drainage. An additional factor that would handicap ground operations is severe winter weather. Temperatures remain below freezing during the period late October through March, and minimums slightly below -50°F. have been recorded on the Kamchatka Peninsula and Sakhalin. Minimums near -20°F. have been recorded in the Kuril Islands. Depth of snow cover ranges from 1 to 6 feet throughout the winter and is greatest in the southern parts of the Kamchatka Peninsula and on the higher parts of Sakhalin.

The region is unsuited for airmobile and airborne operations. High relief precludes the landing of troops in most of the area and is an obstacle to low-level air approaches. The steep, rugged relief also precludes airfield construction in most of the area. Poor drainage presents major construction problems in the plains.

The coastline of this region is unsuited for amphibious operations, and the numerous beaches do not afford access to selected internal routes or strategic areas.

The Insular and Peninsular Far East region is well suited for irregular force operations. The densely forested, rugged mountains offer good cover and concealment for small groups. Natural cover and concealment are generally lacking in the plains. Snow, ranging from 1 to 6 feet in depth, and severe cold would be problems to irregular forces in winter. Natural sustenance would be scarce in this region, and it would be difficult to supply troops by sea or air.

C. Strategic areas

Nine strategic areas (Moscow, Donets, Volga-Ural, Leningrad, Baku, Tashkent, Kuznetsk, Baykal and Far Eastern) are of primary importance to the military potential of the Soviet Union. These vary considerably

in size and in the reasons for their importance. Four important areas are located west of 50°E. and are centered on the cities of Moscow, Leningrad, and Baku and on the industrial area of the Donets Basin. Moscow is the political and military center of the Soviet Union as well as a major industrial and communication center. Leningrad is an industrial city and port, and Baku is one of the most important petroleum centers in the nation. The Donets Basin is the most important mining and industrial district of the country. Another important area is the roughly triangular-shaped petroleum-producing, mining, and industrial district which extends from the Volga river, in the vicinity of Kuybyshev and Kazan', eastward to include the central and southern Ural Mountains. In south-central U.S.S.R., an important but relatively isolated industrial center is in the vicinity of Tashkent. East of the Ural Mountains and north of Tashkent are three widely separated areas of major strategic significance. Located on the Trans-Siberian railroad, they are the mining, manufacturing, and communication complexes of the Kuznetsk and Baykal strategic areas and the rail terminus and port of Vladivostok on the Sea of Japan in the Far Eastern strategic area.

The Soviet Arctic also is of strategic importance. Because of its location in relation to transpolar air routes, the Soviet Arctic affords advanced sites for defensive installations such as early warning systems and interceptor bases, and for offensive bases for launching Soviet air power and missiles. The Soviet Arctic acquires additional importance because of the Northern Sea Route, which, despite severe physical limitations and the short navigation season (about 2 months), has strategic importance as the shortest route between Atlantic and Pacific Soviet ports. During a war it would become an important consideration in Soviet efforts to maintain two-ocean naval mobility. The only major Soviet port north of the Black Sea that is entirely ice free and that has year-round access to the Atlantic is Murmansk.

1. Moscow

Situated on a nearly flat plain in the European U.S.S.R., the Moscow strategic area (Figure 9) is both the political and military capital of the country.

Moscow (Figure 10) is the largest (population 6,942,000 in 1970) and most important urban area in the Soviet Union. The city has the largest concentration of diversified industry in the country and is a major center for scientific and industrial research. There are numerous industrial installations within the urban area which produce a wide range of products, including munitions, heavy and light machinery, electronic equipment, chemicals, guided missiles and components, airframes and jet engines, motor vehicles, and ball bearings. The city is the site of Moscow State University and the national headquarters of the Academy of Sciences and numerous scientific institutes. In addition, Moscow is the largest telecommunication center in the country, a hub of the gas pipeline system, and the focal

25X1



FIGURE 9. Moscow strategic area

25X1

point of the transportation systems. The river port areas are among the largest inland harbors in the country. The Moscow area is the principal domestic and international air communication center with many important civil and military airfields. It is also the central headquarters of the Soviet military forces, a center of advanced military training, and the site of extensive and varied storage facilities.

2. Donets

The most important mining and basic metallurgical district in the U.S.S.R., the Donets strategic area (Figure 11), contains extensive coal and iron-ore mines (Figure 12), numerous centers of heavy industry, well-developed electric power facilities, and a dense railroad network. This strategic area is about 400 miles south of Moscow, north of the Black Sea.

The Donets strategic area is a major producer of pig iron (about 50% in 1965) and steel. Nowhere else in the Soviet Union is such an abundance of good coal, iron ore, limestone, and manganese found in such close proximity. The coal mines are concentrated in the eastern part of the area, about 200 miles east of the iron-ore deposits at Krivoy Rog. A major natural gas producing area is centered just south of Khar'kov, and important gas pipelines extend from the region. Rich manganese deposits are located near Nikopol'.

Important industrial centers within the strategic area include Khar'kov, Donetsk, Dnepropetrovsk, Rostov, Zaporozh'ye, and Voroshilovgrad. Khar'kov (population 1,223,000 in 1970) is a leading producer of heavy industrial machinery and equipment; important products include aircraft, locomotives, tractors, tanks, turbines, heavy electrical equipment, machine tools, agricultural and mining machinery, radios, and ball bearings. Donetsk (population 879,000 in 1970) and the neighboring area is an important center of iron and steel production, coal mining, and chemical manufacturing, particularly explosives and fertilizers. Dnepropetrovsk (population 863,000 in 1970) is one of the most important centers for the production of guided missiles, ingot steel and finished steel products, and heavy industrial equipment and machinery. Powerplants, an important coke-chemical plant, and a large rubber-tire factory are located in and near the city. Rostov (population 789,000 in 1970), a nationally important industrial center, is a leading producer of agricultural machinery. It also produces diversified industrial machinery, helicopters, and chemicals. The city is also a primary telecommunications switching center in the national network. Zaporozh'ye (population 658,000 in 1970) is one of the principal metalworking centers of the U.S.S.R. It is a producer of aluminum and an outstanding producer of high-quality steel for missile tubing, jet-engine turbine blades, and armor plate. The city also contains an important aircraft-engine plant, a major electric transformer plant, and is the site of a large hydroelectric powerplant. Voroshilovgrad (population 382,000 in 1970) is the site of a large thermal powerplant and is the leading producer of locomotives in the country.

A dense transportation network and a power-transmission grid serve the area. Most transportation is by rail; highways are used only for short hauls. The rivers near the eastern and western margins of the strategic area are of little importance for intra-area movement. Important transportation centers are Rostov and Khar'kov. Rostov, near the mouth of the Don river, is a transshipment point between railroads and the inland water route to the Volga river. Khar'kov is the main rail junction of lines leading from the Donets Basin directly to Moscow.

3. Volga-Ural

The Volga-Ural strategic area (Figure 13) is the most important petroleum-producing and refining area and the second most important mining and metallurgical district in the Soviet Union. The large reserves of metallic ore and crude petroleum have promoted the rapid industrial development of the area. This strategic area extends from east of the Ural Mountains to west of the Volga river, a distance of approximately 570 miles, and from Kuybyshev and Magnitogorsk northward about 500 miles to Berezniki.

The chief assets of the Volga-Ural strategic area are its large supplies of petroleum and gas (Figure 14) and an abundance and great variety of mineral resources. In 1968 approximately 70% of the country's total crude oil production came from this region. Numerous crude oil and refined product pipelines as well as refineries and petrochemical plants are in the area. Iron ore is the principal metallic resource, and the richest deposits are on the eastern slopes of the central and southern Urals. Nickel and titanium are also mined. The local supply of good-quality iron ore and alloy minerals, in addition to coal brought in from Karaganda, has made the Ural Mountains especially important in the production of high-grade steel.

Nine cities in the strategic area each have a population exceeding 250,000. Kuybyshev (population 1,047,000 in 1970), a major port on the Volga river, is the largest producer of refined petroleum products in the U.S.S.R. and ranks second as a producer of roller and ball bearings. The city is important as a center for telecommunications, the integrated aircraft industry, guided-missile production, the aerospace industry, and the manufacture of machine tools, armaments, electrical equipment, and motor vehicles. A major rocket-engine testing complex is in the northwest environs, and one of the country's largest hydroelectric powerplants is near the city. Sverdlovsk (population 1,026,000 in 1970) is one of the leading industrial, transportation, and telecommunication centers in the U.S.S.R. The city is the second largest producer of refined copper and is a major producer of metallurgical and oilfield equipment, heavy machinery, steel, armaments, electrical equipment, and chemicals. Situated in a natural gateway through the Ural Mountains, the city is a focal point for rail and highway traffic between the European U.S.S.R. and Siberia. Chelyabinsk (population 874,000 in 1970) has industrial

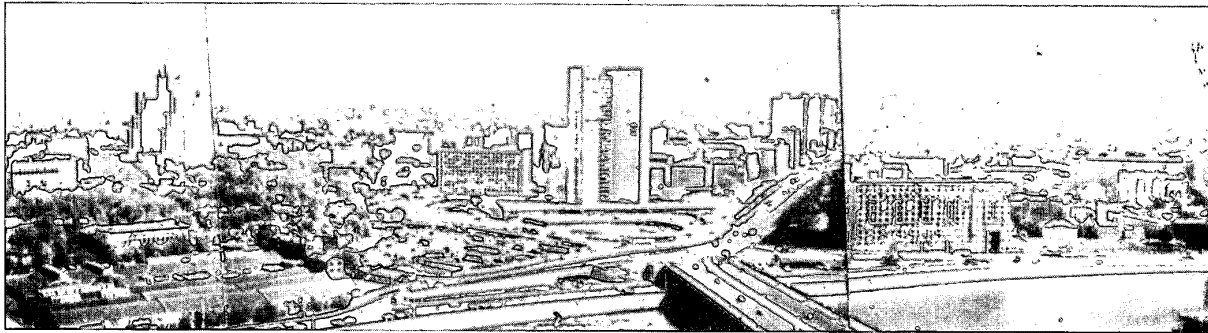


FIGURE 10. Central Moscow viewed from the Ukraina Hotel () 25X1

FIGURE 11. Donets strategic area ()

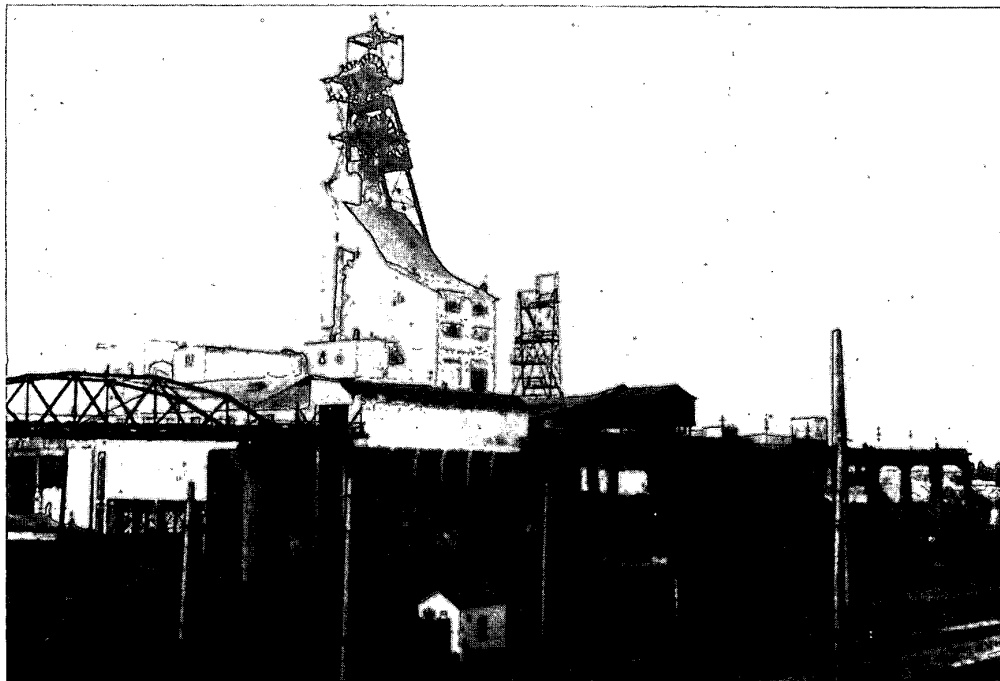
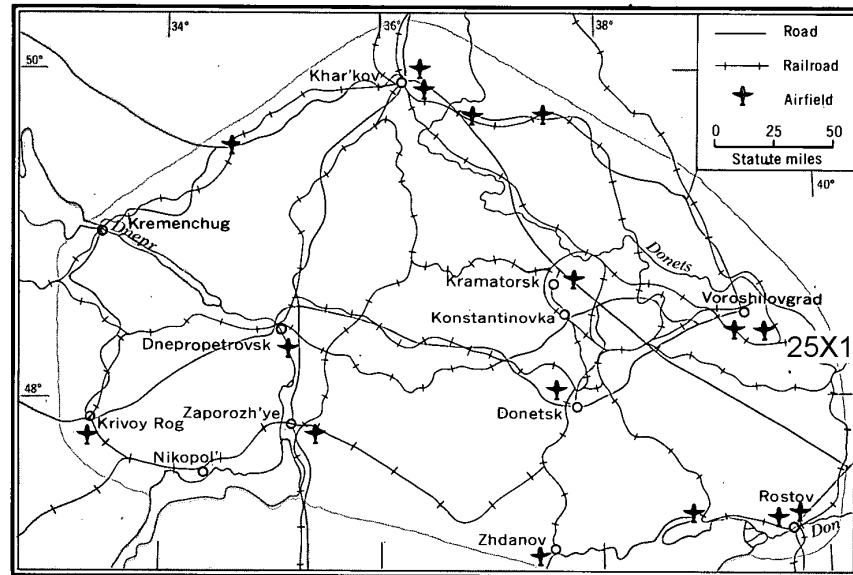


FIGURE 12. A shaft iron-ore mine at Krivoy Rog () 25X1

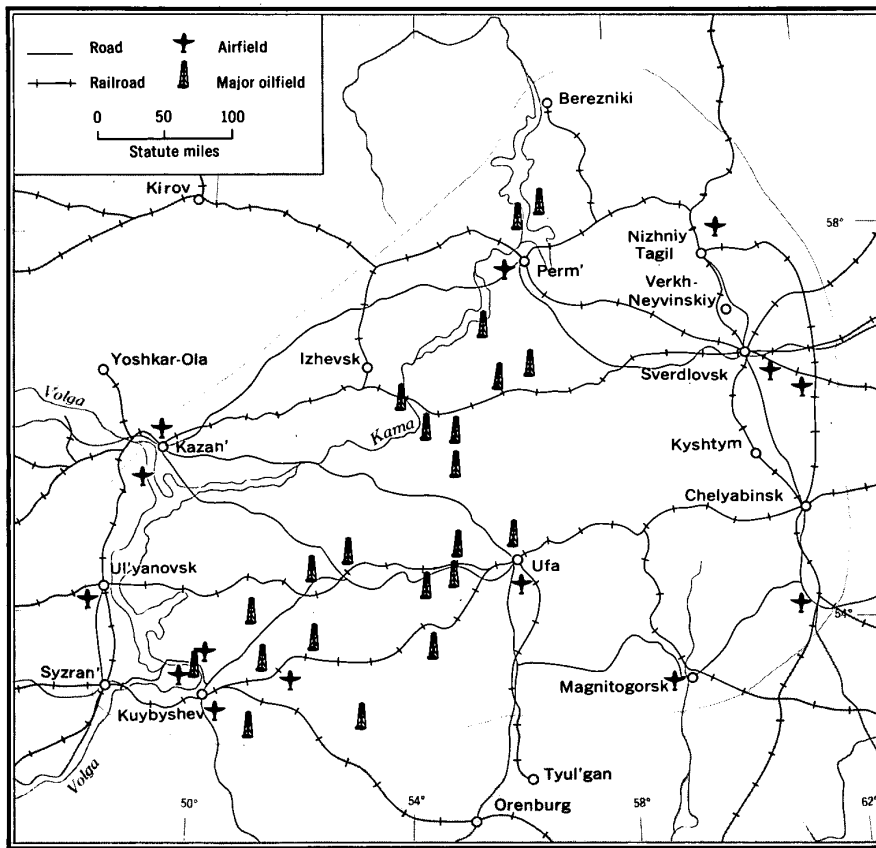


FIGURE 13. Volga-Ural strategic area

25X1



FIGURE 14. Gas-producing field in the Volga-Ural strategic area

25X1

plants that specialize in metallurgy, machine building, and armaments. It also has a large iron and steel plant and is a major railroad center. Kazan' (population 869,000 in 1970) is a nationally significant industrial center and transshipment point on the Volga river. It is the largest producer of polyethylene in the U.S.S.R. and is a major producer of airplanes, turbine engines, and phenol. One of the largest shipyards on the Volga is near the city. Perm' (population 850,000 in 1970) is a nationally significant producer of war materiel; one of the U.S.S.R.'s largest munitions plants and a large

armaments plant are located there. Other important installations produce aircraft engines, refined petroleum products, chemicals, and heavy machinery. It is also a major inland port. Ufa (population 773,000 in 1970) is mainly an oil-refining center but also contains two aircraft engine plants. One of the engine plants is also engaged in the production of guided missile propulsion equipment. Izhevsk (population 422,000 in 1970) is the largest producer of small arms and automatic weapons in the U.S.S.R. It also produces motor vehicles, machinery, and construction materials.

Nizhniy Tagil (population 378,000 in 1970) contains a large steel mill, a railroad freight-car plant, and factories producing tanks and artillery shells. Magnitogorsk (population 364,000 in 1970) is the site of the largest steel mill in the country and has numerous iron mines in the vicinity. Throughout the strategic area, smaller industrial towns are engaged principally in the manufacture of products connected with the iron, steel, and petroleum industries. A large chemical plant at Berezniki, which also contains a magnesium refinery, utilizes local potash deposits. This chemical plant and another at Krasnotur'insk (outside the area at 59°46'N., 60°12'E.) are producing heavy water for the atomic energy program. A plutonium production plant and a uranium isotope separation plant are at Kyshtym and Verkh-Neyvinskiy, respectively. Production of electric power in the strategic area utilizes coal, oil, and gas from local fields and coal from northeastern Kazakhstan. Some powerplants also use gas from Central Asian and West Siberian gasfields. There are large hydroelectric stations on the Kama and Volga rivers.

Most of the transportation lines that link the European U.S.S.R. with Siberia pass through the Volga-Ural strategic area. These lines consist mainly of railroads, which are also the most important means of transportation within the strategic area, and a few less important highways and navigable rivers.

4. Leningrad

The Leningrad strategic area (Figure 15) is an important transportation, industrial, and cultural center located at the head of the Gulf of Finland, a narrow arm of the Baltic Sea. The area can be approached from the west through the Gulf of Finland, but this relatively narrow water approach is guarded by numerous Soviet defensive installations.

Leningrad is the second largest city in the U.S.S.R. (population 3,513,000 in 1970). It has the most extensive port facilities in the country and is the Baltic Sea terminus of an inland waterway system which links it with the White, Black, and Caspian Seas. Manufacturing in the city consists of the production of precision instruments, optical and electrical equipment, heavy industrial machinery, machine tools, and armaments. Leningrad is also a nationally important center of the chemical industry and produces basic chemicals, mineral fertilizers, plastics, synthetic rubber, and pharmaceuticals. The city is one of the two largest centers of scientific, technological, and educational facilities in the U.S.S.R. Leningrad is the foremost shipbuilding center of the country; the shipyards produce many types of ships, including cargo vessels, submarines, tankers, destroyers, and minesweepers, and have built an atomic icebreaker. A civil airfield and many military airfields are dispersed around the city.

About 15 miles west of Leningrad is the fortress of Kronshtadt, which is located on an island that serves as an operational base for the Soviet Baltic Fleet. The naval base has extensive storage facilities, including

several ordnance depots. The island has the largest ship-repair facility and most extensive drydocking facilities in the country.

5. Baku

An important petroleum area, the Baku strategic area (Figure 16) is situated on the west coast of the Caspian Sea and has had a nationally significant role as a supplier of fuel for the Soviet economy. More recently the area has played a greater role in refining and processing crude oil from other regions.

Baku (population 847,000 in 1970), the most important city in the strategic area, is one of the largest petroleum-refining centers and a leading producer of heavy oilfield equipment in the Soviet Union. One of the largest concentrations of refined petroleum products and crude oil storage facilities in the country is located in Baku and its environs. Offshore oilfields (Figure 17) supply over half of Azerbaijan crude oil production. Chemical plants, closely associated with the petroleum industry, produce sulfuric acid, oxygen, acetylene, synthetic rubber, caustic soda, iodine, and pharmaceutical products. The city is the main port and naval base on the Caspian Sea. The shipyards within the port provide the most complete shipbuilding and repair facilities on the Caspian Sea coast. The Baku strategic area is the terminus of a double-track Transcaucasia railroad line, controls the railroad and highway connections to Iran, and is the eastern terminus of pipelines and a railroad that lead from Baku to the Black Sea port of Batumi. Four military airfields and a seaplane station are located in or near the city.

6. Tashkent

The Tashkent strategic area (Figure 18) is an important industrial, petroleum-producing, and mining area in south-central U.S.S.R. Only 70 miles from the Communist China border, this strategic area is isolated from other parts of the U.S.S.R. by deserts to the west and north. It is bounded on the east and south by the rugged Tien Shan. The industrial significance of this area has increased greatly since World War II.

There are oilfields near Fergana, and oil and natural gas fields near Andizhan. Coal is mined near Angren. Other mineral deposits have been exploited, including sulfur, zinc, copper, tungsten, and molybdenum. Mercury and uranium ores are mined in the mountains south of Fergana.

Tashkent (population 1,385,000 in 1970) is the largest city in the strategic area. The city contains a nuclear research center, an aircraft plant, an electron-tube plant, and a storage-battery plant. Tractors, excavators, paper, and cotton textiles are produced in the city.

Chimkent (population 247,000 in 1970) is the largest lead smelting and refining center in the U.S.S.R. and one of the most important industrial and commercial centers of the Kazakh S.S.R. It produces machinery, construction materials, textiles, processed agricultural products, pharmaceuticals, and chemicals. It is also an important junction of national transportation lines and

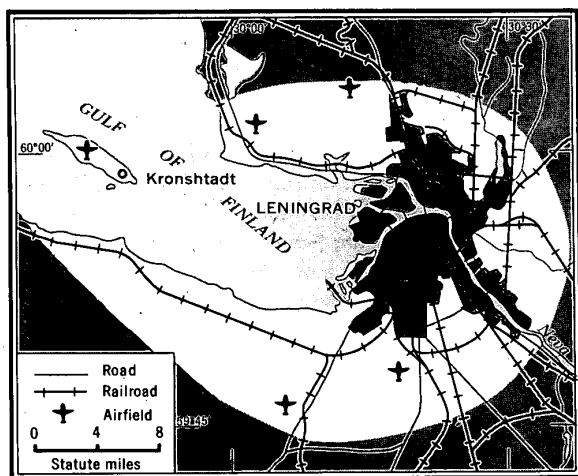


FIGURE 15. Leningrad strategic area

is the site of a very important military airfield. It contains several colleges and administrative and cultural centers.

Other significant industries in the strategic area include a metallurgical plant in Bekabad, construction machinery plants at Andizhan, a superphosphate plant at Kokand, and petroleum refineries at Fergana.

The major railroad in the area connects Krasnovodsk, on the Caspian Sea, and Tashkent with the Kuznetsk strategic area. The rail connection from central European U.S.S.R., extending through Kuybyshev, joins this line at Tashkent.

7. Kuznetsk

The Kuznetsk strategic area (Figure 19) is the most important mining and manufacturing district east of the Volga-Ural strategic area. Its industrial development is based primarily on the coal deposits around Kemerovo and Novokuznetsk. In addition to the Kuznetsk Basin, the strategic area includes the adjacent Novosibirsk-

Barnaul manufacturing belt and the city of Tomsk. The most important industry in the strategic area is the manufacture of iron and steel, but nonferrous metallurgical industries such as zinc, tin, and aluminum are also significant. The iron mines near Tashtagol have increased the significance of this strategic area. Coke production, based on the coalfields centered around Prokop'yevsk, Anzhero-Sudzhensk, Leninsk-Kuznetskiy, and Kiselevsk, is the basis of gas, chemical, and fertilizer production in the area.

There are six towns in the strategic area with populations exceeding 250,000. Novosibirsk (population 1,161,000 in 1970) is one of the largest cities in the U.S.S.R. and the largest producer of refined uranium and tin. It is a major machine-building and metalworking center; factories also produce electronic and optical equipment. The city contains textile mills, extensive stockyards and slaughterhouses, and large flour mills. It is a major telecommunication center and the headquarters for the Siberian military district. The Trans-Siberian railroad crosses the north-flowing Ob' river at Novosibirsk. The city is also an important river port and the northern terminus of the railroad from the Tashkent strategic area. A large scientific center, one of the largest in the world, is located south of the city. Barnaul (population 439,000 in 1970), a port on the Ob' river, is one of the largest producers of diesel engines and high-pressure boilers in the U.S.S.R. The city also contains plants that manufacture railroad cars, small arms ammunition, and textiles. Novokuznetsk (population 499,000 in 1970) is a major producer of iron, steel, aluminum, and coke. Kemerovo (population 385,000 in 1970) is an important center of the Soviet coke-chemical industry, and a manufacturer of munitions, high explosives, chlorine, nitric acid, and caprolactam. Tomsk (population 339,000 in 1970) contains a plutonium production plant and a uranium isotope separation plant. The city has the only large ball-bearing plant outside the European U.S.S.R.

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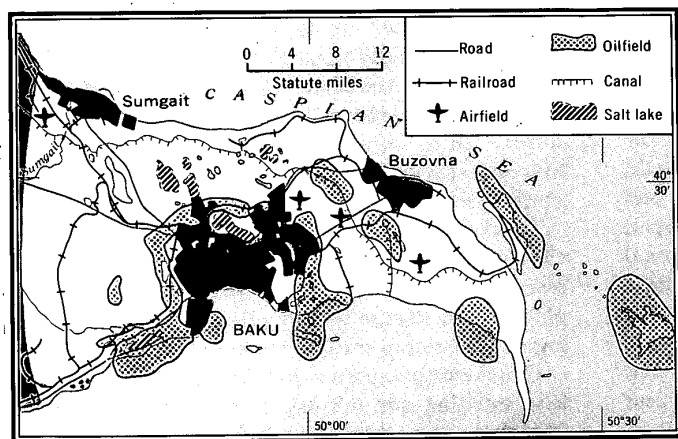
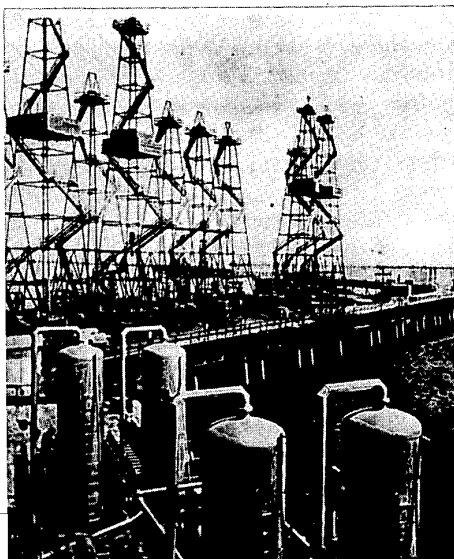


FIGURE 16. Baku strategic area

FIGURE 17. Offshore oilwells in the Caspian Sea near Baku



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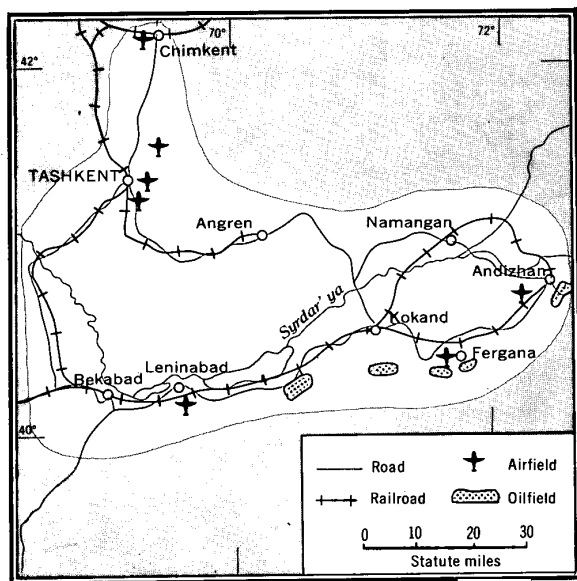


FIGURE 18. Tashkent strategic area

Prokop'yevsk (population 275,000 in 1970) is a major coal center, producing about 40% of the annual coal yield in the Kuznetsk Basin. A large zinc smelter is located at Belovo.

8. Baykal

The Baykal strategic area (Figure 20), which extends along the Trans-Siberian railroad for about 625 miles, derives its importance from its few but significant transportation junctions and from the Soviet industrial policy of locating plants along this route.

Seven centers—Cheremkhovo, Usol'ye Sibirskoye, Angarsk, Irkutsk, Ulan-Ude, Petrovsk-Zabaykal'skiy, and Chita—are served directly by the Trans-Siberian railroad; Irkutsk, Ulan-Ude, Chita, and Angarsk are the most important. Irkutsk (population 451,000 in 1970) is a major railroad classification and repair center, a hub of domestic and international air routes, and the leading port on the Angara river. It is also an important industrial center, whose products include aircraft,

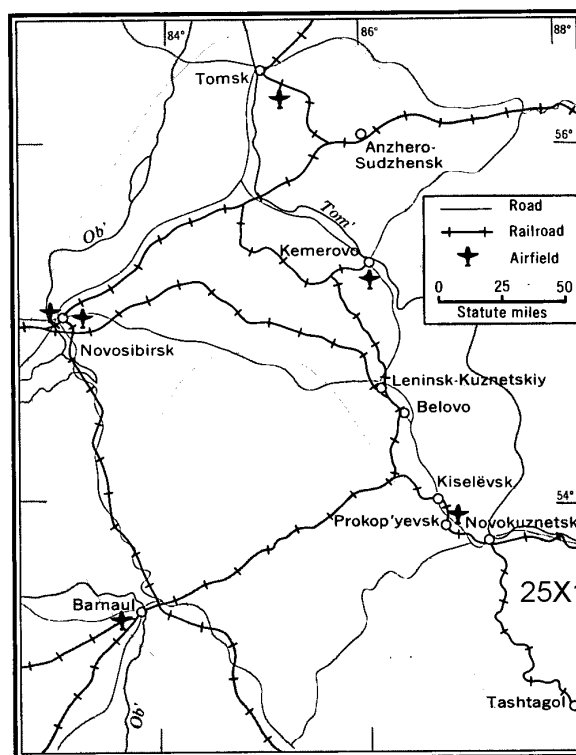


FIGURE 19. Kuznetsk strategic area

metallurgical and mining equipment, and radio equipment. A large aluminum refinery is located near the city. Irkutsk is also the site of two major airfields, many barracks, and military supply depots. Ulan-Ude (population 254,000 in 1970) is a major transportation and industrial center. It is at a strategic junction of the Trans-Siberian railroad and an important railroad and highway extending to the U.S.S.R.-Mongolia border. The city is also the site of many barracks, storage facilities, a major locomotive and railroad-car repair plant, an aircraft-assembly plant, and several large plants producing consumer goods. Chita (population 242,000 in 1970) is a large military center. The city

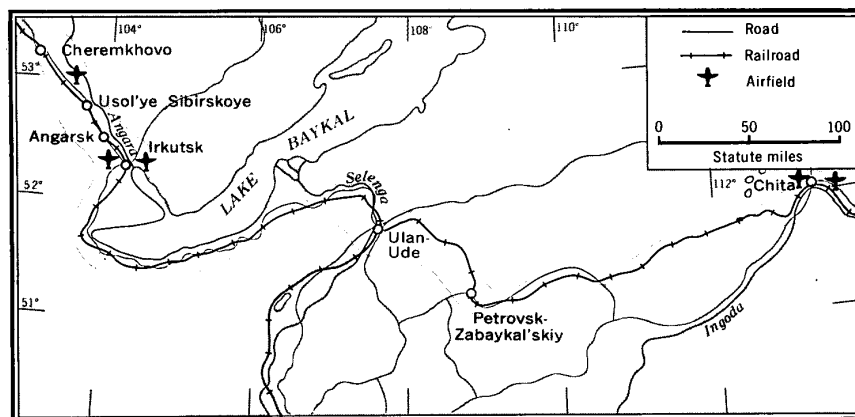


FIGURE 20. Baykal strategic area

contains extensive troop-billeting facilities and military supply depots, an air defense sector headquarters, and two military airfields. The city also contains a large railroad repair center and is the terminus of roads from the U.S.S.R.-Mongolia border. Angarsk (population 204,000 in 1970) is the site of a uranium isotope separation plant, a large petroleum refinery, a plastics plant, a nitrogenous fertilizer plant, and several important construction materials plants. Cheremkhovo is the site of a large battery plant. Petrovsk-Zabaykal'skiy is the site of the largest steel plant in central Siberia. A chemical plant is located at Usol'ye-Sibirskoye.

Effective exploitation of the coal mines between Cheremkhovo and Irkutsk is dependent on uninterrupted operation of the Trans-Siberian railroad. This consideration is equally pertinent to the tungsten and molybdenum mines near Ulan-Ude, the uranium mines north of Petrovsk-Zabaykal'skiy, and the other rich mines, chiefly lead, zinc, and rare metal ores, near Chita. Several railroad tunnels near the southern end of Lake Baykal are critical bottlenecks.

The Bratsk hydroelectric powerplant, located about 225 miles north of the strategic area, is the second largest powerplant in the world and supplies much of the electric power used in the strategic area.

9. Far Eastern

The Far Eastern strategic area (Figure 21) fronts on the Sea of Japan, partly parallels the Communist China border, and extends about 600 miles from the coast near Vladivostok in the south to Komsomol'sk in the north.

Vladivostok (population 442,000 in 1970) is the most important naval base, the largest ship-repair center, and the second largest commercial port in the eastern U.S.S.R. The excellently equipped port, which is kept open in winter by icebreakers, is the eastern terminus of the Trans-Siberian railroad. The city contains extensive storage facilities for refined petroleum products, munitions, and general stores, several naval training installations, and many billeting facilities. Air facilities include seaplane bases and many fighter bases. Major industries in the Vladivostok area are shipbuilding and repair, food canning, and numerous light industries, largely connected with fishing enterprises. In addition, there are industries producing electrical equipment and munitions.

Nakhodka (population 105,000 in 1970) is the largest commercial port on the Pacific coast of the U.S.S.R. It has extensive wharfage, mechanized cargo-handling facilities, and a military port capacity of 36,000 long tons of general cargo per day. It is also a naval base for patrol craft. The city contains extensive storage facilities for refined petroleum products, general stores, munitions, and torpedoes, and numerous billeting facilities. Major industries include shipbuilding and repair, fishing, fish processing, sawmills, and a tin can factory.

Khabarovsk (population 437,000 in 1970) is a major transportation center on the Trans-Siberian railroad

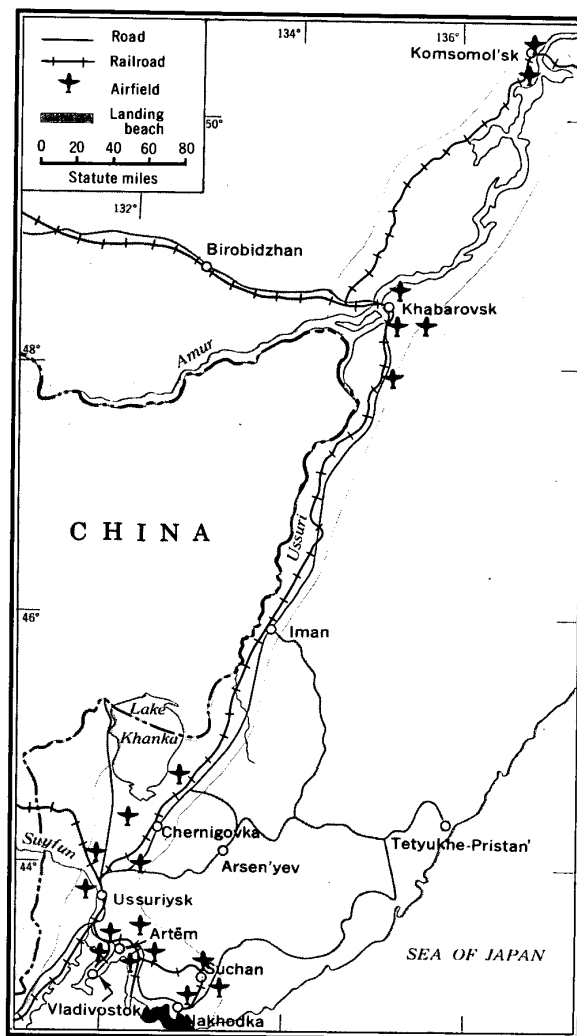


FIGURE 21. Far Eastern strategic area

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and the principal industrial, oil-distribution, telecommunication, and commercial center in the Soviet Far East; the port facilities are the largest on the Amur river. Industries of national significance include the manufacture of diesel engines, agricultural machinery, and electric wire and cable. The city also produces machine tools, power machinery, heating equipment, and refined petroleum products. Komsomol'sk (population 218,000 in 1970) is one of the major urban areas in the Soviet Far East. Situated on the Amur river, it contains the largest shipyard in eastern Siberia. Other nationally significant installations include the second largest manufacturer of submarine batteries and the third largest producer of jet fighter planes. The city derives additional importance as a producer of foundry equipment and as the site of the only steel plant and one of the two petroleum refineries in eastern Siberia.

Other important centers are scattered throughout the strategic area and include Ussuriysk, at the junction of the Trans-Siberian railroad and the line that extends

across Communist China to Chita, and the coal mining areas around Suchan and Artëm.

Although of less significance than the strategic areas discussed above, the following urban areas are important:

NAME	LOCATION ° 'N. ° 'E.	IMPORTANCE
Alma-Ata . . .	43 15 76 57	Population 730,000 in 1970. Second largest city in Soviet Central Asia and third largest producer of torpedoes in U.S.S.R. National industrial center producing heavy machinery, munitions, electrical and telecommunication equipment, and construction materials.
Gor'kiy . . .	56 20 44 00	Population 1,170,000 in 1970. Together with satellite city of Dzerzhinsk, third largest industrial center, ranking first in production of motor vehicles, rivercraft, chemicals, and large-caliber guns. Major Volga river port and river-railroad transshipment point.
Kiyev	50 26 30 31	Population 1,632,000 in 1970. Third largest city in U.S.S.R. Prominent cultural, military, transportation, and telecommunication center. Produces a wide variety of industrial products, such as aircraft, machinery, machine tools, and construction materials.
Krasnoyarsk	56 01 92 50	Population 648,000 in 1970. Major producer of armaments and site of one of the largest aluminum plants in U.S.S.R. Uranium isotope separation and plutonium production plants in vicinity, each the largest of its kind in country. Also produces synthetic rubber, heavy machinery, and agricultural machinery. Water and rail transshipment site for much of Yenisey river basin. Site of largest powerplant in world (on Yenisey river). Headquarters for Trans-Siberian railroad.
Odessa	46 28 30 43	Population 892,000 in 1970. Major commercial port (including Il'ichëvsk) on the Black Sea. Contains the country's largest maritime passenger terminal and handles the second largest volume of cargo. Center for shipbuilding, ship repair, metal processing, machine building, and food processing.

NAME	LOCATION ° 'N. ° 'E.	IMPORTANCE
Saratov . . .	51 34 46 02	Population 758,000 in 1970. Center for oil and gas production, petroleum refining, the integrated aircraft industry, and manufacture and assembly of guided missiles. Nationally important production center for industrial machinery, machine tools, electric equipment, chemicals, trolley buses, tractor parts, and bearings. A major transportation hub on the Volga river.
Tula	54 12 37 37	Population 462,000 in 1970. Industrial center near large coal and iron-ore deposits. Major industrial activities include production of armaments, ammunition, and agricultural machinery.
Volgograd . .	48 45 44 25	Population 818,000 in 1970. Nationally significant producer of guns, ammunition, explosives, and chemical-warfare agents. Other industrial products include steel, tractors, chemicals, machinery, and rivercraft. Large aluminum and ball-bearing plants and petroleum refinery. Site of one of largest hydroelectric powerplants in U.S.S.R. (on Volga river). Major transportation center, river port, and water-rail transshipment point.
Yaroslavl' . .	57 37 39 52	Population 517,000 in 1970. Industrial center, nationally important in production of synthetic chemicals, petrochemicals, tires, and diesel engines. Major rail center and water-rail transshipment point.

D. Internal routes (C)

The selected internal routes (Figure 22) are the easiest avenues of movement between strategic areas, from land and sea approaches to strategic areas, and between internal routes. Most of the roads considered are improved and are accompanied by railroads over most of their lengths. Roads and railroads are greatly influenced by seasonal conditions.

Offroad dispersal and cross-country movement are also greatly influenced by seasonal factors such as snow during the winter months and flooding during spring thaw. Conditions vary from good to fair in the plains regions to poor in the mountain and hill regions which are heavily forested and extremely rugged in places. Detailed information on internal routes is given in Figure 23.

E. Approaches

The perimeter of the U.S.S.R. consists of about 12,600 miles of land boundaries and approximately 29,000

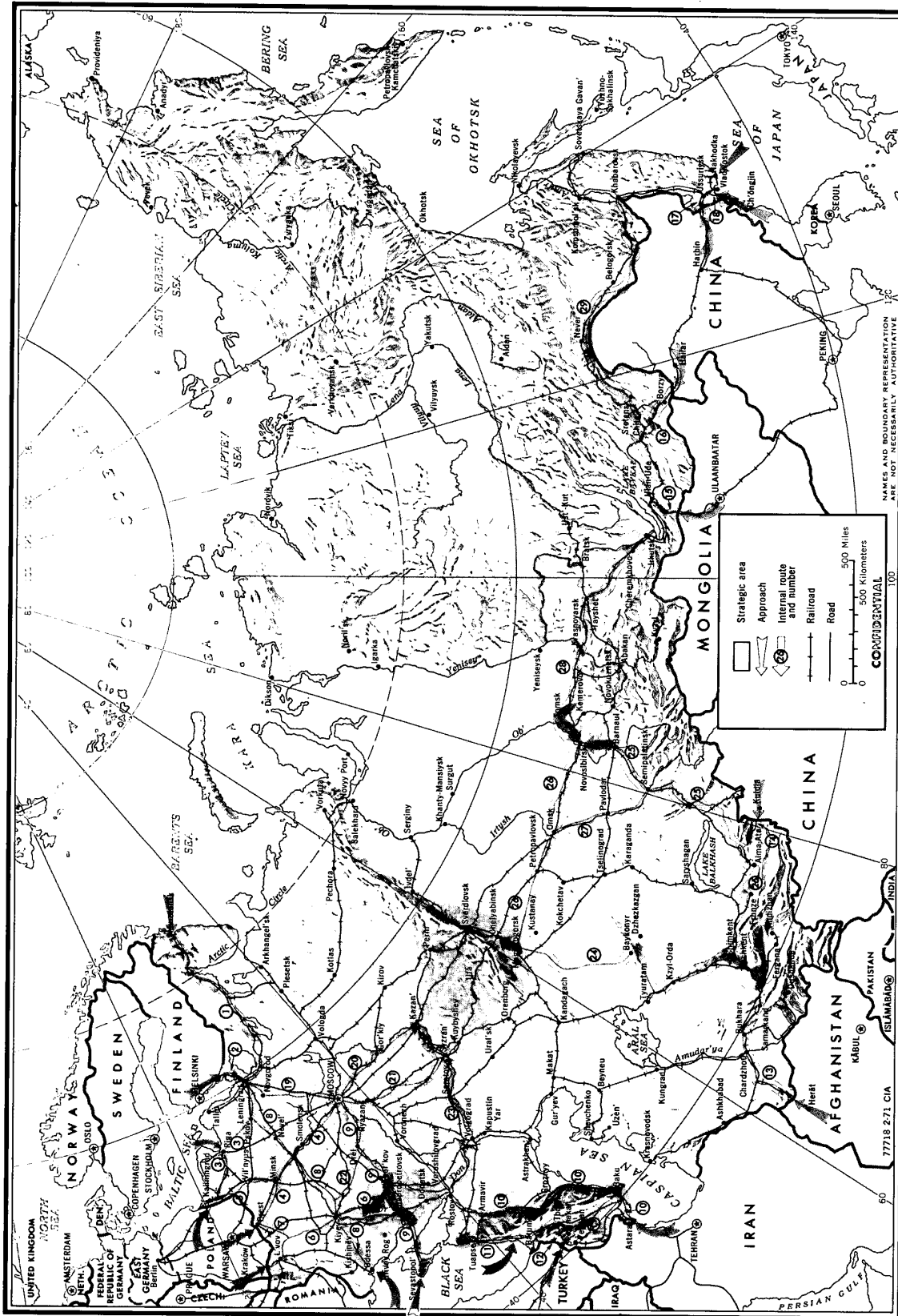


FIGURE 22. Strategic areas, internal routes, and approaches

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FIGURE 23. INTERNAL ROUTES

MAP REF. NO. *	ROUTE AND TERRAIN	ROAD	RAILROAD	OFFROAD DISPERSAL AND CROSS-COUNTRY MOVEMENT
1	Murmansk to Leningrad strategic area. Densely forested mountains, steep hills, and plains. Bogs common in hills and mountains; marshes, swamps, lakes, and streams common in plains.	Two lanes; bituminous and gravel surfaced; fair condition. Some sharp curves and steep grades. Subject to deep snowdrifts from November to April. Portions being reconstructed; completion expected in 1971.	Single track, 5'0" gage, ** from Murmansk to Apatty (115 miles south of Murmansk*** and from Belomorsk to Volkhov. Double track from Apatty to Belomorsk, and from Volkhov to Leningrad. Electrified from Murmansk to Kandalaksha and from Volkhov to Leningrad. Fourteen railroad bridges ranging from 330 to 1,244 feet in length.	Movement unsuited because of rugged terrain near Murmansk and dense forests, marshes, bogs, and deep streams south of Murmansk. Some highly directionalized movement possible when streams frozen (November to mid-April). Snow also hinders movement in winter.
2	Finland border near Vyborg to Leningrad strategic area. Densely forested plains with numerous bogs, lakes, streams, and swamps.	Two lanes; bituminous surfaced; good condition. Moderate gradients and curves.	Single track from Finland border to Roshchino (36 miles northwest of Leningrad). Double track from Roshchino to Leningrad. Electrified from Vyborg to Leningrad. Two railroad bridges, 700 and 1,500 feet in length.	Movement unsuited because of wet, soft, and miry ground and dense forests. Some highly directionalized movement possible when streams frozen (December to April).
3	Poland border near Kaliningrad to Leningrad strategic area. Flat to rolling cultivated plains with many forest patches, bogs, and marshes.	Two lanes; bituminous and concrete surfaced; fair to good condition. Bridge over Daugava river at Riga 1,476 feet long. Moderate gradients and curves.	Dual gage, 5'0" and 4'8 1/2", from border to Kaliningrad. Double track from Kaliningrad to Chernyakhovsk (56 miles east of Kaliningrad, from Balozi (8 miles south of Riga) to Riga, and from Siverskaya (46 miles south of Leningrad) to Leningrad. Single track from Chernyakhovsk to Balozi from Riga to Ieriki (46 miles northeast of Riga), and from Pskov to Siverskaya. Electrified from Jelgava (26 miles southwest of Riga) to Riga, and from Siverskaya to Leningrad. Highway only from Ieriki to Pskov. Nine railroad bridges ranging from 550 feet to 2,500 feet in length.	Movement fair to unsuited. Difficult and highly restricted by forests, streams, bogs, and swamps. Severely restricted by miry ground from early March to early May and mid-October to mid-December.
4	Poland border near Brest to Moscow strategic area. Cultivated and forested plains with numerous marshes, swamps, and streams.	Two to three lanes; bituminous and concrete surfaced; good condition. Gentle grades and moderate curves.	Double track. Electrified from Borodino (75 miles west of Moscow) to Moscow. Six railroad bridges ranging from 330 to 550 feet in length.	Movement fair to unsuited. Very difficult and restricted because of forests, marshes, and deep streams. Severely restricted by miry ground from early March to early May and mid-October to mid-December.
5	Route connecting internal routes from Poland border (Kaliningrad) to Leningrad strategic area and from Poland border (Brest) to Moscow strategic area. Flat to rolling plains. Streams bordered by swamps and marshes. Large streams deep year round.	Two lanes; bituminous surfaced; fair to good condition. Moderate curves and grades. Bridge 1,138 feet long at Kaunas.	Double track. Electrified from Molodechno (48 miles northwest of Minsk) to Minsk. Two railroad bridges, 650 and 1,070 feet, and 1 tunnel, 3,940 feet in length.	Movement poor. Difficult and restricted because of soft, miry ground, streams, and swamps, especially in spring and late autumn.

Footnotes at end of table.

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FIGURE 23. INTERNAL ROUTES (Continued)

MAP REF. NO. *	ROUTE AND TERRAIN	ROAD	RAILROAD	OFFROAD DISPERSAL AND CROSS-COUNTRY MOVEMENT
6	Poland border near L'vov to Khar'kov in Donets strategic area. Flat to rolling, grass-covered and sparsely forested plains. Most streams small and steep-banked.	Two lanes; bituminous surfaced; good condition. Moderate curves and grades. Bridge over Dnepr river at Kiyev 5,000 feet long.	Dual gage, 5'0" and 4'9 1/2", from Poland border to Mostiska Pervaya (48 miles west of L'vov). Double track from Mostiska Pervaya to Kiyev. Single track from Kiyev to Poltava (87 miles southwest of Khar'kov). Double track from Poltava to Khar'kov. Electrified from L'vov to Kiyev and from Lyubotin (15 miles west of Khar'kov) to Khar'kov. Eight railroad bridges ranging from 175 to 3,750 feet in length.	Movement good to poor. Easy most of year on grass-covered plains; difficult in spring and late autumn when soils miry.
7	From Brest to route connecting Poland border near L'vov and Donets strategic area. Cultivated, flat to rolling and dissected plains with patches of forest.	Two lanes; bituminous and stone-block surfaced; fair to good condition. Moderate curves and grades.	Single track to Kovel', double track from Kovel' to Rovno. Three bridges, ranging from 270 to 450 feet in length.	Movement poor to fair. Severely restricted from Brest to Kovel' because of dense forests and miry ground. Easier from Kovel' to Rovno because of less dense forests and more level terrain, but local flooding and wet ground still pose problems. Movement fair to poor. Moderately restricted by steep streambanks and gullies from Odessa to Kiyev. Severely restricted from Kiyev to Pskov by dense forests, marshes, bogs, and swamps. Miry ground and deep streams pose problems.
8	From amphibious landing area at Odessa to Pskov on route connecting Poland border to Leningrad strategic area. Flat to moderately dissected plains with small stands of trees and both steep-banked, deep streams and low-banked, shallow streams from Odessa to Kiyev. Flat to rolling plains with numerous bogs, swamps, marshes, and streams from Kiyev to Pskov.	Two lanes; concrete, bituminous, and stone-block surfaced; fair to good condition. Moderate curves and grades. Bridge 1,886 feet long over Desna river at Chernigov.	Highway only from Odessa to Kiyev. Double track from Kiyev to Gomel'. Single track from Gomel' to Nevel'. Highway only from Nevel' to Pskov. Electrified from Kiyev to Bakhmach (120 miles northeast of Kiyev). Eight railroad bridges ranging from 430 to 3,060 feet in length.	
9	Amphibious landing area near Sevastopol' through Donets strategic area to Moscow strategic area. Flat to rolling and dissected grass-covered and cultivated plains with patches of forest. Some steep-banked streams.	Two to three lanes; bituminous surfaced; fair to good condition. Moderate curves and some steep grades.	Single track from Sevastopol' to Simferopol', and double track from Simferopol' to Moscow. Electrified from Melitopol' to Moscow. Seven bridges ranging from 350 to 1,800 feet, and 4 railroad tunnels ranging from 950 to 2,000 feet in length.	Good to fair most of year on grass-covered plains in south. Movement on mostly dissected plains from Khar'kov to Moscow more difficult, especially during spring and late autumn when soils are soft and miry.
10	Iran border at Astara, through Baku strategic area to Rostov in Donets strategic area. Mostly grass-covered plains with some low hills. Few large, steep-banked streams, bogs, and marshes.	Two lanes; bituminous and gravel surfaced; fair to poor condition. Some sharp curves, steep grades, and narrow, low-capacity bridges. Sections of road subject to flooding during periods of heavy rains.	Single track from Astara to Alyat (45 miles southwest of Baku), and double track from Alyat to Rostov, includes 2 single-track lines from Gudermes to Prokhladnyy. Electrified from Alyat to Sumgait (24 miles northwest of Baku) and from Mineral'nyye Vody to Rostov. One railroad and highway bridge 760 feet, and 18 railroad bridges from 350 to 1,900 feet in length.	Movement fair over plains, somewhat restricted by flooding and marshes. Restricted movement on route near Caspian Sea because of marshes and miry ground in spring.

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| 11 | From route connecting Donets strategic area, near Rostov, and Baku strategic area along east coast of Black Sea, including amphibious landing area, to Baku strategic area. Flat, grass-covered plain from Rostov to Krasnodar. Densely forested mountains and steep hills from Krasnodar to Tbilisi. Mostly flat to rolling plains from Tbilisi to Baku. | One to two lanes; bituminous, concrete, and gravel surfaced; good condition. Numerous steep grades, sharp curves, and narrow bridges. Section of road in mountainous areas subject to landslides and snow blockage. | Single track from Tikhoretsk (85 miles northeast of Krasnodar) to Krymsk (33 miles northeast of Novorossiysk) and double track from Krymsk to Novorossiysk. One bridge 900 feet long. Highway only from Novorossiysk to Tuapse. Single track electrified from Tuapse to Tbilisi. Double track and electrified from Tbilisi to Baku. One railroad and highway bridge 1,550 feet, 37 railroad bridges ranging from 300 to 1,400 feet, and 9 railroad tunnels ranging from 3,900 to 13,000 feet in length. | Fair to good from Rostov to Krasnodar. Poor and very difficult from Krasnodar to Tbilisi because of steep slopes, some forests, and swift streams. During winter snow in mountains makes movement very difficult. Fair to good from Tbilisi to Baku on cultivated or grass-covered plains. |
| 12 | Turkey border to Tbilisi on internal route which borders Black Sea to Baku strategic area. Forested mountains and steep hills. | One to two lanes; bituminous, crushed-stone, and gravel surfaced; good condition. Numerous sharp curves, steep grades, and narrow, low-capacity bridges. | Single track from border to Navtlugi Pervyye (4 miles southeast of Tbilisi). Double track from Navtlugi Pervyye to Tbilisi. Electrified from Leninakan to Tbilisi. Two railroad bridges, 320 and 500 feet, and one tunnel 5,000 feet in length. | Movement poor to unsuited. Difficult and restricted because of rugged terrain, forests, and rockstrewn slopes. |
| 13 | Afghanistan border to Tashkent strategic area. Predominantly flat to rolling plains. Few small hills and some steep-sided gullies. | Two lanes; bituminous, gravel, and earth surfaced; poor to fair condition. Moderate curves and grades. Some sections subject to flooding in winter. Ferry across Amudarya river at Chardzhou. | Single track from the Afghanistan border to Samarkand, and from Dzhizak (70 miles east of Samarkand) to Khavast (94 miles south of Tashkent). Double track from Samarkand to Dzhizak and from Khavast to Tashkent. Three railroad bridges, 410, 1,200, and 5,300 feet in length. | Movement fair to good on the plains. Miry soils in spring and drifting, steep-sided sand dunes make movement difficult locally. |
| 14 | Communist China border near Kuldja to Sary-Ozek (95 miles northeast of Alma-Ata) on route connecting Tashkent strategic area to Kuznetak strategic area. Dissected plains and hills, some flat to rolling plains, and some mountains. | Two lanes; bituminous surfaced; fair condition. Numerous sharp curves and steep grades. No seasonal restrictions. | None..... | Movement poor. Very difficult because of steep slopes and dissected plains. Miry ground and flooding during spring thaw. |
| 15 | Mongolia border to Baykal strategic area. Dissected plains flanked by rugged hills. | Two lanes; bituminous surfaced; good condition. No known bottlenecks. | Single track. Four railroad bridges, ranging from 650 to 1,850 feet in length. | Movement poor. Restricted by deep streams and marshes. Miry soils in spring and snowdrifts in winter are additional difficulties. |
| 16 | Communist China border near Hailar to Baykal strategic area. Mostly cultivated, flat to rolling and dissected plains. | Two lanes; bituminous and gravel surfaced; fair to poor condition. Some steep grades. | Single track. Three railroad bridges, 1,200, 1,300, and 700 feet in length. | Movement on plains fair except when soils miry during spring thaw. Movement in hills unsuited because of steep slopes. |
| 17 | Communist China border near Harbin to Far Eastern strategic area. Moderately dissected, cultivated plains and marshland; some hills. | Two lanes; gravel surfaced; fair condition. Moderate grades and curves. | Single track. One railroad tunnel 400 feet, one railroad bridge 420 feet in length. | Movement fair. Moderately restricted by dissected slopes and steep-banked streams. Soils miry for a 4-week period starting mid-April. Snow cover may exceed 10 inches in winter. |
| 18 | North Korea border to Far Eastern strategic area. Rugged hills, cultivated plains, and marshland. | Two lanes; gravel surfaced; good condition. Moderate grades and curves. Combination highway and railroad bridge, 1,770 feet in length, at Khasan. | Single track. One railroad and highway bridge, 1,770 feet, and 13 railroad bridges ranging from 400 to 1,100 feet in length. | Movement fair. Moderately restricted to difficult because of dissected slopes and steep-banked streams. Soils miry for a 4-week period starting mid-April. Snow cover may exceed 10 inches in winter. |

Footnotes at end of table.

FIGURE 23. INTERNAL ROUTES (Continued)

MAP REF. NO. *	ROUTE AND TERRAIN	ROAD	RAILROAD	OFFROAD DISPERSAL AND CROSS-COUNTRY MOVEMENT
19	Moscow strategic area to Leningrad strategic area. Densely forested plains with numerous bogs, marshes, lakes, and streams.	Two to three lanes; concrete and bituminous surfaced; good condition. Moderate grades and curves.	Double track and electrified. Five railroad bridges ranging from 480 to 1,200 feet in length.	Movement unsuited. Very difficult because of miry ground and dense forests. Some movement on frozen streams possible December to April.
20	Moscow strategic area to Kazan' in Volga-Ural strategic area. Densely forested and cultivated plains with many marshes, swamps, lakes, and streams.	Two lanes; bituminous and gravel surfaced; fair to poor condition. Moderate curves and grades. Ferry across Volga river at Zelenodol'sk (30 miles west of Kazan').	Double track and electrified from Moscow to Gor'kiy. Highway only from Gor'kiy to Kazan'. Three railroad bridges, 500, 1,060, and 1,100 feet in length.	Movement poor to unsuited. Difficult and directionally restricted because of dense forests, steep-banked streams and gullies. Miry ground, especially during spring thaw, makes movement very difficult.
21	Moscow strategic area to Syzran' in Volga-Ural strategic area. Flat to rolling and dissected plains with many steep-banked streams. Contains some areas of forests, bogs, marshes, and swamps.	Two lanes; bituminous surfaced; good condition. Moderate curves and grades.	Double track and electrified from Moscow to Zubova Polyana (280 miles southeast of Moscow). Highway only from Zubova Polyana to Penza. Double track, and electrified from Penza to Syzran'. Five railroad bridges ranging from 492 to 1,700 feet in length.	Movement fair to poor. Restricted in direction by steep streambanks. Miry ground and deep streams during spring thaw adds much difficulty. Snow cover may exceed 1 foot in winter.
22	Route connecting internal routes from amphibious landing area near Odessa to Leningrad strategic area and from amphibious landing area near Sevastopol' to Moscow strategic area. Flat to rolling cultivated plains with many steep-banked streams. Few bogs and marshes.	Two lanes; concrete surfaced; good condition. Few curves and moderate grades.	None.....	Movement generally fair to poor. Deep streams and steep banks restrict movement. Miry ground, late February to early May, severely hinders movement.
23	From Syzran' in Volga-Ural strategic area to Rostov in Donets strategic area. Dissected, grass-covered and cultivated plains crossed by steep-banked streams.	Two lanes; bituminous, gravel, and earth surfaced; fair condition. Moderate curves and grades. Ferry across Don river at Kalach-na-Donu (45 miles west of Volgograd).	Single track from Syzran' to Petrov Val (142 miles northeast of Volgograd). Highway only from Petrov Val to Volgograd. Double track from Volgograd to Kruten'kiy (9 miles west of Volgograd). Single track from Kruten'kiy to Dmitriyevka (81 miles southwest of Volgograd). Double track from Dmitriyevka to Surovikino (90 miles southwest of Volgograd). Highway only from Surovikino to Rostov. Three railroad bridges ranging from 430 to 2,350 feet in length.	Movement fair to poor. Restricted in direction by deep streams, gullies, and miry ground late February to early May.
24	Tashkent strategic area to Volga-Ural strategic area. Predominantly flat to rolling plains with some poorly drained depressions. Few streams.	One to two lanes; bituminous, gravel, and earth surfaced; poor condition. Negligible curves and grades. Sandstorms in summer create difficult driving conditions.	Double track from Tashkent to Arys', single track from Arys' to Dzhusaly (335 miles northwest of Arys'). Highway only from Dzhusaly to Troitsk. Double track and electrified from Troitsk to Chelyabinsk. Four railroad bridges ranging from 500 to 740 feet in length.	Movement on the plains mostly fair except for 1- to 3-week period beginning in early April when soils soft and muddy.

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| 25 | Tashkent strategic area to Kuznetsk strategic area. Predominantly flat to rolling and dissected plains; few hilly areas. Some sand dunes and cultivated areas. | One to two lanes; bituminous, gravel, and earth surfaced; poor to good condition. Some sharp curves and steep grades. Sandstorms in summer create difficult driving conditions. | Double track from Tashkent to Chu, Semipalatinsk to Barnaul, and from Matveyevka (12 miles south of Novosibirsk) to Novosibirsk. Single track from Chu to Semipalatinsk and from Barnaul to Matveyevka. Electrified from Barnaul to Novosibirsk. Five railroad bridges ranging from 395 to 2,080 feet in length. | Movement fair to poor. Restricted by gullies and ravines, and, in spring, by miry ground. Snow may exceed 1 foot in winter. |
| 26 | Kuznetsk strategic area to route connecting Tashkent and Volga-Ural strategic areas. Grass-covered and cultivated plains with scattered marshes, lakes, and seasonally soft depressions. | One to two lanes; gravel and earth surfaced; fair to poor condition. Moderate grades and curves. | Double track and electrified from Novosibirsk to Petropavlovsk. Highway only from Petropavlovsk to Troitsk. Three railroad bridges, 2,750, 2,300, and 840 feet in length. | Movement fair to good. Restricted by lakes and marshes year round. Soils miry for 1- to 3-week period beginning in April. |
| 27 | Connects Kuznetsk and Tashkent strategic areas internal route to Kuznetsk and Volga-Ural strategic areas internal route. Flat to rolling, grass-covered plains; moderately dissected in places. | One to two lanes; gravel and earth surfaced; fair to poor condition. Moderate grades and curves. | Single track from Omsk to Irtyshk (103 miles southeast of Omsk). Highway only from Irtyshk to Semipalatinsk. One railroad bridge 2,000 feet in length. | Movement good to fair. Some local hindrances caused by steep-banked streams. Severely restricted in spring because of unfordable streams and muddy ground. |
| 28 | Kuznetsk strategic area to Baykal strategic area. Predominantly dissected plains; mostly grass-covered and cultivated in west, forested in east. | Two lanes; gravel and earth surfaced; fair to poor condition. Some steep grades and sharp curves. | Double track and electrified. Thirteen railroad bridges ranging from 350 to 3,040 feet in length. | Movement fair on plains but hindered by miry ground and deep streams during April and May. |
| 29 | Baykal strategic area to Far Eastern strategic area. Mostly forested flat to rolling and dissected plains and low hills. Few marshes and lakes; numerous streams. | One to two lanes; crushed stone and earth surfaced; poor to fair condition. Ferry across Amur river at Khabarovsk; ferry across the Zeya river at Blagoveshchensk. | Double track. Thirty-one railroad bridges ranging from 300 to 8,550 feet, and 5 railroad tunnels ranging from 2,900 to 18,480 feet in length. | Movement poor to unsuited because of dense forests and locally steep slopes. |

*Numbers correspond to those on Figure 22.

**Unless otherwise specified, all rail lines are 5'0" gage.

***Because of the small scale of the Terrain and Transportation map and the Strategic Areas, Internal Routes, and Approaches map, only the larger cities and towns and the major drainage features are shown. Locations of towns and railroad stations mentioned in the table but not shown on the maps are indicated by statements (in parentheses) of their direction and distance from the nearest large town or city.

FIGURE 24. LAND BOUNDARIES

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BOUNDARY	APPROXI- MATE LENGTH	STATUS	TERRAIN
	<i>Miles</i>		
Norway.....	120	Demarcated and undisputed. No significant fortifications.	Hills and plains, forest or shrub-covered, some stunted birch and small, dense stands of pine in south.
Finland.....	820	....do.....	Steep-sided hills with rounded tops in north, flat to rolling plains in south. Forests on plains and hills. Plains poorly drained. Low ridges common in lowlands.
Poland.....	775	....do.....	Flat to gently rolling plains. Mostly cultivated; some forests and swampy areas. Hills and mountains of Carpathian Mountains in extreme south.
Czechoslovakia.....	60	....do.....	Densely forested hills and mountains in north. Cultivated, flat to gently rolling plains in south.
Hungary.....	75	....do.....	Flat to gently rolling plains. Cultivated crops; some patches of forest and brush.
Romania.....	840	....do.....	Mountains, hills, and plains. Densely forested Carpathian Mountains and foothills in west. Boundary in east formed by Prut river. Mainly dissected plains and steep hills. Boundary along arm of Danube in extreme east swampy, marshy, and poorly drained.
Turkey.....	385	Demarcated and undisputed. No significant fortifications. Few garrisons.	Forested mountains in western two-thirds. Many deep ravines and gorges. Grassy, partly cultivated, flat to rolling plain in eastern third.
Iran.....	1,225	Demarcated and undisputed. Some permanent light fortifications.	West of Caspian Sea: Rugged, forested mountains separated by semiarid, flat to rolling plains. East of Caspian Sea: Mostly grass-covered hills and mountains flanked on east and west by barren, flat to rolling plains.
Afghanistan.....	1,480	Border surveyed but not demarcated. Undisputed. No permanent fortifications.	Grass-covered or barren, flat to rolling plains flanked on the west by steep, grass-covered hills and on the east by high, rugged, mostly barren mountains.
Communist China.....	4,670	Demarcated and delimited for most of its length by international agreements; however, 4 short segments in dispute; most of eastern portion marked by broad deep rivers. No significant fortifications.	Western portion of border: High, rugged mountains with both rounded and sharp crests. Some permanent snowfields and glaciers at elevations above 10,000 feet. Scattered intermontane basins. Eastern portion of border: Predominantly flat to rolling forested plains separated by 3 hill groups. Scattered cultivated areas.
Mongolia.....	2,135	Undisputed and mostly demarcated. Some pre-World War II forts on U.S.S.R. side of border.	Rugged, forested mountains separated by plains and rolling hills.
North Korea.....	10	Undisputed and marked by river. No significant fortifications.	Flat, swampy region backed by hills.

miles of coastline, including the island of Sakhalin. The Soviet Union claims jurisdiction to 12 nautical miles from its coasts and claims sovereignty, under the sector doctrine, over all the ocean area which extends from the U.S.S.R. mainland to the North Pole between 35°E. and 170°W. The Soviet Union also claims control over the Caspian Sea north of a line connecting the two segments of the land boundary between the U.S.S.R. and Iran. The United States does not recognize any of these Soviet maritime claims. Figure 24 presents detailed information on land boundaries. (U/OU)

1. Land

Although many points along the border of the U.S.S.R. are passable for ground movement into or out of the country, only 12 approaches, those having the best access to strategic areas within the U.S.S.R., have

been selected. Detailed information on these approaches is presented in Figure 25.

2. Sea

The coast of the U.S.S.R. is generally unsuitable for large-scale amphibious landings because of stretches of rugged coast, ice-clogged approaches, and lack of suitable exits inland. The most suitable amphibious areas are as follows: on the Black Sea near Odessa (Figure 26), on the western side of the Crimean Peninsula, and along the southeastern coast of the Black Sea; on the Baltic Sea in the vicinity of Riga; on the Arctic coast, the only suitable area is a stretch along the north coast of the Kola Peninsula east of Polyarnyy; along the Pacific coast, the suitable areas are those that afford access to Vladivostok and Nakhodka. Figure 27 presents detailed information on the amphibious landing areas shown on the Summary Map (Figure 186).

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FIGURE 25. LAND APPROACHES

APPROACH AND TERRAIN	ROAD	RAILROAD	OFFROAD DISPERSAL AND CROSS-COUNTRY MOVEMENT
From Finland. Chiefly forested plains. Many bogs, marshes, and swamps.	Two to three lanes; improved gravel surface; fair condition; 3-foot shoulders. Road lined with trees.	Single track, 5'0" gage.	Movement poor. Hindered by dense forests and bogs. Snowfall from late November through late March and flooding in April and May greatly hinder movement.
From northern Poland. Flat to gently rolling, mostly cultivated plains.	Two lanes; bituminous surface; good condition; 3-foot shoulders. Road lined with trees.	Dual gage, 5'0" and 4'8 1/2". Several change-of-gage facilities. Crosses one important bridge.	Movement good to fair. Locally restricted by unfordable streams and forest patches. Severely hindered by soft ground during spring thaw.
From central Poland. Flat to gently rolling, mostly cultivated plains. Many marshes and swamps.	Two to three lanes, bituminous and concrete surface; good condition. Thirty-ton capacity bridge at border near Terespol.	Dual gage, 5'0" and 4'8 1/2". Two bridges cross Bug river, one of each gage. Numerous change-of-gage facilities.	Movement fair to poor. Restricted by marshes, swamps, and unfordable streams.
From southern Poland. Rolling, partially forested plains.	Two lanes; bituminous surface; good condition; 3- to 6-foot shoulders.	Dual gage, 5'0" and 4'8 1/2"; electrified. Change-of-gage facilities at border. Crosses 3 large bridges.	Movement fair. Restricted by forests, streams, wet areas, and locally steep slopes. Severely hindered by soft ground during spring thaw.
From Turkey. Flat to rolling plains.	Two lanes; crushed-stone or gravel surface. Crosses one bridge 130 feet long. Poor to fair condition.	Single track, 4'8 1/2" gage. Change-of-gage facility on U.S.S.R. side of border.	Movement fair. Locally restricted by steep stream-banks. Streams unfordable at times during period early November through April.
From Iran. Flat to rolling coastal plains backed by steep, forested mountains.	Two lanes; gravel surface; poor condition.	None.	Movement fair to poor. Restricted by steep stream-banks and locally by rough, bouldery surfaces.
From Afghanistan. Dissected hills and plains, few ridges and escarpments.	Two lanes; concrete surface; fair condition; 4- to 6-foot shoulders.	.....do.....	Movement fair. Hindered by steep slopes and locally by stones and boulders. Difficult when ground muddy from early December to March.
From Kuldja, Communist China. Flat to gently rolling, grass-covered plains with steep-banked streams.	One to two lanes; gravel or bituminous surface; fair condition. Numerous sharp curves and steep gradients.	.....do.....	Movement fair to poor. Restricted by steep-banked or unfordable streams.
From Mongolia. Dissected, grass-covered plains.	Two lanes; gravel surface; fair condition.	Single track, 5'0" gage.	Movement poor. Restricted by gullies, rough surfaces, and steep-banked streams. Severely hindered by miry soils during spring thaw and after rains.
From Communist China, west of Hailar. Flat to rolling, grass-covered plains.	Single lane; earth and gravel surface; fair to poor condition; passable in dry weather.	Single track, 4'8 1/2" gage. Change-of-gage facility at border.	Movement good but hindered by snowdrifts in winter.
From Communist China, east of Harbin. Forested hills and grass-covered plains.	Two lanes; gravel surface; poor condition; passable in dry weather. Moderate to steep grades and curves.	Single track, 4'8 1/2" gage. Change-of-gage facility at border.	Movement in hills poor because of steep, forested slopes. Movement in plains poor because of steep-banked streams. Snow from February through March may exceed 10 inches and greatly hinder movement.
From North Korea. Low mountains and flat plains.	Two lanes; gravel surface; fair condition. Crosses 2 large bridges.	Single track, 4'8 1/2" gage. Change-of-gage facility near border. Passes over several bridges and through many tunnels.	May exceed 10 inches and greatly hinder movement. Movement poor to unsuited because of steep slopes, local dense forests, steep-sided streams, and rice paddies.

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FIGURE 26. One of the three selected beaches in the amphibious landing area near Odessa

3. Air

Air approaches² to the U.S.S.R. are divided into four sectors (Figure 28). The northern air approach is over the vast expanses of the Arctic Ocean except in the extreme east. Terrain obstacles to low-level flight are widely scattered islands in the Arctic Ocean, which have a maximum elevation of almost 3,600 feet above sea level within 125 nautical miles of the U.S.S.R. mainland. In the extreme east, air approaches are across the rugged Alaska ranges, which reach maximum elevations of 5,000 feet within 300 nautical miles of the U.S.S.R. mainland and decrease to about 3,000 feet about 75 nautical miles from the U.S.S.R. The eastern air approach is across the Pacific Ocean and associated seas. The chief obstacle is mountainous northern Japan, which has a maximum elevation of about 7,500 feet above sea level. The southern air approach to the U.S.S.R., for the most part, is across extremely rugged mountainous terrain, which in many places extends into the U.S.S.R. In North Korea, mountains attain maximum elevations of about 9,000 feet above sea level less than 120 nautical miles from the Soviet border. In northeast Communist China, maximum elevations of about 4,600 feet are common less than 50 nautical miles from the U.S.S.R. border. However, a relatively narrow northeast-southwest trending lowland bisects this area and offers low-level access (generally less than 1,000 feet above sea level) to the U.S.S.R. border in the vicinity of Khabarovsk. In eastern Mongolia, maximum elevations of more than 4,000 feet above sea level are within 20 nautical miles of the border. From eastern Mongolia to the Afghanistan border, mountain ranges with elevations of about 10,000 feet and occasional peaks

and crests over 15,000 feet straddle the international boundary. From Afghanistan through Turkey, mountains attain elevations of more than 5,000 feet above sea level, with individual peaks and crests often exceeding 12,000 feet above sea level less than 100 nautical miles from the U.S.S.R. border. However, the Black Sea, north of central and western Turkey, and the Caspian Sea, north of central Iran, permit low-level access to the U.S.S.R. The western air approach to the U.S.S.R. crosses the complex mountain masses of southern Europe in the south, the flat to gently rolling plain of northern Europe and the Baltic Sea in the center, and the mountainous backbone of the Scandinavian Peninsula in the north. Elevations over 5,000 feet above sea level are common throughout the southern half of the approach, and in places peaks rise over 8,000 feet above sea level within 125 nautical miles of the U.S.S.R. border. On the Scandinavian Peninsula, maximum elevations are between 5,000 and 7,000 feet above sea level within 300 nautical miles of the U.S.S.R.

Weather conditions are most favorable for flight during summer (principally June through August) except in the northern sector and in the eastern half of the southern sector, where they are best in winter (principally December through February). Migratory lows and associated fronts are primarily responsible for less favorable conditions during the remainder of the year. These lows present the most hazardous weather conditions in the eastern sector, particularly during winter when they are most intense. They are least frequent over much of the eastern half of the southern sector, where they occur mostly in spring through autumn. Typhoons occasionally enter the Sea of Japan in summer and early autumn but usually degenerate by the time they reach northern Japan. Figure 29 summarizes the important weather factors for flight in each sector.

²The discussion zone for air approaches extends approximately 300 nautical miles beyond the boundaries of the U.S.S.R.

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FIGURE 27. AMPHIBIOUS LANDING AREAS

LOCATION	APPROACH	BEACH	TERRAIN BEHIND BEACH AND EXIT
On coast of Barents Sea in vicinity of Teriberka (50 miles east of Polyarnyy).	Offshore approach clear but flanked on east side by tombolo and by submerged rocks. Nearshore approach partly obstructed by sandbars up to 100 yards off low-water line. Nearshore bottom mud; nearshore bottom gradient ranges from 1 on 30 to 1 on 120. Average winter sea ice rarely forms along this coast. In severe winters sea ice may be present from February to May. Surf 4 feet or higher infrequent during all seasons. Tidal range 10.3 feet, springs.	Beach, at Teriberka, 1 mile long; all usable; width 30 to 125 yards at low water, 10 to 25 yards at high water; gradient 1 on 15 to 1 on 30, low water to high water, 1 on 15 in high-water zone. Material: sand.	Beach immediately backed by lowland 75 to 1,000 yards wide, narrowing to river valley behind west half; rugged hills back lowland behind east half and extend several miles inland. Exits cross-country or by trails to minor port of Teriberka behind west part of beach.
Along coast of Baltic Sea for approximately 40 miles in vicinity of Riga.	Offshore approach clear except for wrecks; nearshore approach partly obstructed by scattered rocks, shifting sandbars, and spoil ground. Nearshore bottom sand; nearshore bottom gradient ranges from 1 on 60 to 1 on 135. Few places suitable for dry-ramp LST landings. Ice generally forms in December and lasts until April; navigation hindered only during January through March. Surf 4 feet or higher ranges from 12% in May to 30% in February and August. Tidal range negligible.	One amphibious landing area with a total of 3 beaches ranging in length from 9 to 13 miles; total length 35 miles, all usable; widths range from 30 to 500 yards. Material: sand.	Two beaches backed by brush-covered dunes and ridges and one beach by cliff; all, in turn, backed by level to undulating cultivated plain crossed by rivers and streams; scattered marshy areas, swamp, and villages on plain. Exit by tracks and trails or by streets of towns and villages to surfaced coastal road 100 yards to 3 1/2 miles inland.
Along coast of Black Sea for approximately 15 miles in vicinity of Odessa.	Offshore approach partly obstructed by a bank, shoals, rocks, and a few piers and flanked by wrecks; nearshore approach partly obstructed by shoals, rocks, and a few piers; nearshore bottom mud, sand, and shell; nearshore bottom gradient 1 on 60 to 1 on 130. Few places suitable for dry-ramp LST landings. Ice occurs approximately 40 days a year between early January and early March. Surf 4 feet or higher 7% of the time during summer and infrequent during all other seasons. Tidal range negligible.	One amphibious landing area with a total of 3 beaches ranging in length from 450 yards to 4 miles; total length 5 1/2 miles, all usable; widths range from 10 to 50 yards. Material: sand and gravel.	Two beaches backed by sandy strip and one beach by dump area; all, in turn, backed by partly cultivated plain; lake on plain. Exit by tracks and trails or by city streets to surfaced coastal road 75 to 1,000 yards inland.
Along coast of Black Sea for approximately 19 miles in vicinity of Yevpatoriya.	Offshore approach mostly clear except for shoal; nearshore approach partly obstructed by shifting sandbars and shoal; nearshore bottom materials sand, mud, gravel, and shell; nearshore bottom gradient 1 on 60 to 1 on 135. Few places suitable for dry-ramp LST landings. Ice less than 10 days in February. Surf 4 feet or higher 12% of the time January to March, 7% April to June, 6% July to September, 8% October to December. Tidal range negligible.	One amphibious landing area with a total of 5 beaches ranging in length from 1 1/2 to 7 1/2 miles; total length 15 3/4 miles, all usable; widths range from 15 to 50 yards; gradient ranges from 1 on 15 to 1 on 30. Material: sand, shell, and gravel.	Beaches backed by partly marshy, sandy area and by minor port; in turn backed by level to undulating partly cultivated plain; numerous villages on plain. Exit by tracks and trails to village streets. Surfaced roads lead inland from Yevpatoriya.
Along coast of Black Sea for approximately 7 miles in vicinity of Feodosiya.	Offshore approach clear; nearshore approach clear except for wreck; nearshore bottom materials mud, sand, and shell; nearshore bottom gradient 1 on 30 to 1 on 120. Few places suitable for dry-ramp LST landings. Ice less than 10 days a year in February. Surf 4 feet or higher expected 5% of the time January to June, 7% October to December, and infrequent in other months. Tidal range negligible.	One amphibious landing area with a total of 2 beaches of 1 3/4 and 3 3/4 miles; total length 5 1/2 miles, all usable; widths range from 10 to 40 yards; gradient ranges from 1 on 15 to 1 on 30. Material: sand, gravel, shell, and cobbles.	Beaches backed by partly cultivated undulating plain; lakes and marshy area on plain. Exit by tracks, trails, and surfaced coastal road.

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FIGURE 27. AMPHIBIOUS LANDING AREAS (Continued)

LOCATION	APPROACH	BEACH	TERRAIN BEHIND BEACH AND EXIT
Along coast of Black Sea for approximately 38 miles in vicinity of Sukhumi.	Offshore approach mostly clear except for scattered rocks; nearshore approach partly obstructed by shifting sandbars, rocks, and wrecks; nearshore bottom material sand, shell, gravel, and rocks; nearshore bottom gradient 1 on 30 to 1 on 120; places with nearshore gradients of 1 on 50 or steeper are suitable for dry-ramp LST landings. Ice less than 10 days a year in February. Surf 4 feet or higher expected 12% of the time January to March, 10% April to June, 12% July to September, 8% October to December. Tidal range negligible.	One amphibious landing area with a total of 8 beaches ranging in length from 1 1/2 to 11 1/4 miles; total length 33 3/4 miles, all usable; widths range from 5 to 60 yards; gradients 1 on 15. Material: sand, gravel, some cobble and sand.	Four beaches backed by sandy area fronting a cultivated plain; four beaches backed by cultivated plains extending inland to hills; plains covered by brush and woods, some cultivation, scattered villages. Exit by tracks, trails, unsurfaced roads, or streets of town to surfaced coastal road.
Along coast of Black Sea for approximately 36 miles between Poti and Batumi.	Offshore approach mostly clear except for shoal; nearshore approach partly obstructed by shifting sandbars, shoal, and rocks; nearshore bottom material sand, shell, rocks, and mud; nearshore bottom gradients 1 on 15 to 1 on 180. Places with gradients of 1 on 50 or steeper suitable for dry-ramp LST landings. Ice less than 10 days a year in February. Surf 4 feet or higher expected 9% of the time January to March, 7% April to June, 5% July to September, 7% October to December. Tidal range negligible.	One amphibious landing area with a total of 13 beaches ranging in length from 700 yards to 5 1/4 miles; total length 27 1/2 miles, all usable; widths range from 10 to 100 yards, gradient ranges from 1 on 15 to 1 on 60. Material: sand, sand and gravel, some cobble.	Eight beaches backed by sandy beach ridges and port. Most, in turn, backed by cultivated and partly marshy plain extending to forested hills; swamps, streams, and villages on plain. Exit by tracks, trails, streets, unsurfaced roads, and surfaced coastal road.
From Nakhodka, westward along coast of Sea of Japan for approximately 56 miles.	Offshore approaches clear except for a few scattered shoals in the eastern half of the area; nearshore approaches partly obstructed by bars off most beaches, scattered rocks and shoals, and a few piers. Nearshore bottom sand, mud, rock, and gravel; nearshore bottom gradients 1 on 15 to 1 on 105, places with nearshore gradients of 1 on 50 or steeper are suitable for dry-ramp LST landings. Sea ice normally forms in mid-December and lasts until late March. During severe winters sea ice may form in late November and persist until early April. Surf 4 feet or higher ranges from infrequent in summer, winter, and autumn to a maximum of 11% in spring. Tidal range 1 foot, springs.	One amphibious landing area with a total of 18 beaches, ranging in length from 180 yards to 7 1/2 miles; total length 11 1/2 miles, 11 1/4 miles usable; widths range from 10 to 30 yards; gradient ranges from 1 on 5 to 1 on 60. Material: sand and gravel.	Most beaches are backed by sandy strips or by escarpments fronting partly marshy and partly cultivated lowlands or valleys extending inland to nearby wooded hills. Exits by tracks, trails, or unsurfaced roads to nearby towns; routes lead inland to a surfaced coastal road.

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FIGURE 29. AIR APPROACHES

ELEMENT	NORTHERN SECTOR	EASTERN SECTOR	SOUTHERN SECTOR	WESTERN SECTOR
Mean cloudiness (percent).	Maximum 70 to 90 May thru October; minimum 30 to 80 November thru April, except 70 to 80 over Barents Sea.	60 to 90 all year except 40 to 60 over northwestern Sea of Okhotsk and western Sea of Japan during winter.	Minimum 45 or less in summer west of Pakistan, in autumn from Pakistan to Mongolia, and in winter east of Mongolia. Maximum 40 to 80 in winter west of Pakistan, in spring from Pakistan to Mongolia, and in summer east of Mongolia.	Maximum 55 to 90 during winter; minimum 30 to 75 in summer. Most extensive in north.
Thunderstorm days (per month).	Rare all year.	Rare north of 45° N. except infrequent in June, July, or August. Generally infrequent south of 45° N., with maximum 3 or less in June thru November.	April thru October maximum 3 to 7 over rugged terrain in west; 3 to 10 over rugged terrain in east. Central sections have varied frequencies; maximum 5 to 10 in June thru August.	Maximum May thru August; 1 to 5 in north and 3 to 8 in south. Infrequent or rare in the remaining months except 1 or 2 in April and September in south.
Icing.	Mean height of freezing level at surface in winter and near 5,000 feet in midsummer. Icing most likely during summer.	Mean height of freezing level, surface to 2,000 feet in winter, and 4,000 to 15,000 feet in summer; highest in south. Icing most likely in winter.	Mean height of freezing level, surface to 5,000 feet in winter (highest in west), and 13,000 to 15,000 feet in summer. Icing most likely during spring thru autumn in east and during winter in west.	Mean height of freezing level, surface to 4,000 feet in winter, and 6,000 to 13,000 feet in summer; highest in south. Icing is a hazard throughout year.
Turbulence.	Light to severe in migratory lows and fronts.	Light to moderate over mountains of Japan; moderate to severe likely during winter. Light to moderate in cumiform buildups, and moderate to severe in thunderstorms. May be severe in extratropical and tropical cyclones and cold fronts. Severe to extreme near jet stream during winter in south.	Light to moderate at low levels on hot summer days and in cumiform buildups. Light to severe over mountains. Moderate to severe in thunderstorms and in lows and cold fronts.	Light at low levels on hot summer days and in cumiform buildups. Moderate to severe in thunderstorms and possibly extreme in thunderstorms over mountains. Moderate to severe in lows and cold fronts. Various degrees of orographic turbulence over mountains.
Upper winds, direction.	Variable but predominantly westerly.	Predominantly westerly up to at least 55,000 feet.	Predominantly westerly up to at least 55,000 feet, except variable winds likely at lowest levels, particularly in summer.	Predominantly westerly up to at least 55,000 feet, except variable winds likely at lowest levels.
Upper winds, speed (in knots).	Mostly light; maximum mean speeds 20 to 35 between 30,000 and 40,000 feet during all seasons, and up to 50,000 feet during winter.	Maximum mean speeds 25 to 55 in north all seasons, and 50 to 110 autumn through spring in south between 30,000 and 40,000 feet.	Maximum mean speeds 40 to 90 between 30,000 and 50,000 feet during winter.	Maximum mean speeds 30 to 50 between 30,000 and 40,000 feet during all seasons, and up to 50,000 feet during winter.

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3. *Transportation and Telecommunications*

A. General

The maintenance and orderly expansion of the transport and telecommunication (telecom) systems to serve and support the country's economy and military requirements are prime objectives of the Soviet Government. Extensive developments in telecommunications and in virtually every mode of transportation are in progress. The continental expanse of the Soviet Union, with its vast areas of sparse population and much of its terrain and climate hostile to the construction and maintenance of transport and telecom facilities, is the main hindrance to this progress. Despite the enormity of some problems, the growth and development of better facilities continues, although perhaps at a rate slower than Soviet planners anticipate or desire.

The railroads are by far the most important of the inland transportation modes. In many instances they provide the only highly developed means of dependable long-distance movement for both freight and passenger traffic. Inland waterways supplement the rail system, operate at capacity level, and form extensions of key highway routes feeding to and radiating from the major inland ports. The highways provide the principal means of surface transport only in regions devoid of or served inadequately by other modes. The surface freight totaled 17.8 billion short tons in 1969, with highways accounting for 81%, railroads 17%, and waterways 2%. Railroads accounted for 87% of the 1,860.5 billion short-ton-miles produced by the three modes in 1969. The extensive pipeline system is rapidly expanding, but it remains inadequate for current petroleum movement requirements—the railroads still transport 40% to 45% of the products.

Few countries have as much incentive to develop an effective commercial air network as the U.S.S.R., with so much of the country lacking adequate surface routes. Air travel is being widely promoted for long trips, and it now is the primary means for trips exceeding 900 miles. Also, as a major maritime power the U.S.S.R. is continuing to expand its high-seas fleet and areas of operation. Supporting this effort is the system of farflung Soviet deepwater ports, now striving to overcome several deficiencies by a greater adoption of more modern methods and facilities. The civil air, merchant marine, and inland waterway fleets have grown steadily in recent years, and greater expansion is anticipated in the forthcoming decade of the 1970's.

Telecommunications in the U.S.S.R. are adequate to fulfill present economic and military demands;

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however, significant progress in the extensive current development programs must be maintained to insure the continuance of this condition.

The best developed and most heavily utilized portions of the various transportation and telecom systems are located roughly south of a line from Leningrad to Kazan' and west of a line from Kazan' to Volgograd to the Black Sea. Within this area (approximately 10% of the U.S.S.R.) the rail net is so closely knit that very few places are more than 35 miles from a rail line. Approximately 45% to 50% of all freight originations and terminations occur here. The area accounts for about 80% of all inland waterway traffic and contains the greatest mileage of paved roads, and within it are most of the principal ports and airfields. Moscow is the focal point of the rail, road, air, and telecom systems; other significant transport centers are Leningrad, Kiyev, Odessa, and Khar'kov.

A large area (approximately 30% of the U.S.S.R.) to the east and southeast of this major transportation region is serviced principally by a dispersed layout of rail lines and airways, although the Caspian and Aral Seas are locally important inland waterways.

In the remaining area (approximately 60% of the U.S.S.R.) the transportation and telecom patterns consist almost entirely of widely spaced north-south lines running from the three main axes of east-west travel of the country: the transcontinental rail route from Leningrad to Vladivostok, the airways trunk route from Moscow to Khabarovsk, and the Northern Sea Route. These lines vary in purpose from the winter port-servicing function of the Leningrad-Murmansk railroad, to the supply function of major rivers, and to the bridging function of the highway connecting Yakutsk on the Lena river to Never on the Trans-Siberian railroad. The east-west airways trunk route serves as a means of rapid cross-country transport and connects with international routes to China, Mongolia, and North Korea at Irkutsk.

The Northern Sea Route, a shipping lane for the movement of supplies, raw materials, and equipment to the far eastern U.S.S.R. and Siberia, runs along the Arctic seaboard from the Barents Sea to Bering Strait. Although the route connects the Atlantic and Pacific Oceans and lies across the entrances to several large Soviet rivers, fast ice limits its economic and strategic value to a 10-week period from mid-July to late September. The route from Leningrad to Vladivostok (via the White Sea-Baltic waterway) is approximately 500 miles longer than the direct rail route.

The U.S.S.R. is constantly striving to overcome northern maritime travel difficulties. Instrumental in the development of methods are the following: polar stations, which forecast local weather conditions and act as supply, refueling, and administrative bases; aircraft, for forecasting and long-range plotting of icepacks and weather, and for giving navigational advice to shipping; and special icebreakers, which serve as floating observatories and supply ships for polar land stations and as leaders for convoys.

B. Railroads

The Soviet railroad system, owned and operated by the government, occupies the prime position in the transportation industry and accounts for nearly 90% of domestic freight haulage. The nation's economy relies very heavily on railroads. There are 83,015 miles of mainline track in the U.S.S.R.—compared with about 212,000 miles in the United States—and the system comprises the second largest network in the world.

The density of lines is far greater in the west, whereas eastward the network gradually becomes a series of individual lines running to Siberia, Central Asia, and the Soviet Far East. The network density is lower than that of any other developed country in the world—only 0.96 route miles of line per 100 square miles of territory. Moscow, the largest rail center, has 11 lines radiating in all directions and is served by two circumferential lines. Foremost among other rail centers are Leningrad, Sverdlovsk, Khar'kov, and Chelyabinsk. The highest freight densities occur on lines joining the Donets Basin with the Moscow, Leningrad, and Ukrainian regions, and on those connecting the Kuznetsk Basin with the Ural Mountains. The highest freight-flow intensity on a single line is probably that along the Omsk-Novosibirsk sector of the Trans-Siberian railroad.

The most strategic rail routes are the Trans-Siberian, those lines extending from Moscow and Leningrad to the Baltic and Black Sea areas, and those affording international connections with neighboring countries. The partly electrified Trans-Siberian railroad, the only Siberian route with a through capability, is the main artery for the support of Soviet provinces and Communist countries in the Far East. The sparsity of lines in this area and the vulnerability of the Trans-Siberian line have long been matters of prime concern to the country's economic and military planners. Consequently, to provide an alternate route, the Soviets soon may resume construction work on a rail line started during the 1930's. The Baykal-Amur Magistral (BAM) was to run from the Trans-Siberian railroad at Tayshet to the Pacific Ocean at Sovetskaya Gavan', but, except for the Tayshet-Lena and Duki-Komsomol'sk-Sovetskaya Gavan' sectors, it was never completed.

International connections are made with the rail systems of all adjacent countries except Norway. Although Afghanistan has no rail system, it is served by a short broad-gage extension of a U.S.S.R. branch line. Except for the 5'0"-gage networks of Finland and

Mongolia, all connections are with standard-gage (4'8 1/2") systems and transloading is necessary. The 24 rail lines entering the Eastern European Communist countries from the U.S.S.R. utilize the densest concentration of transloading sites in the world. Other transloading sites are located on both sides of borders with Turkey, Iran, Communist China, and North Korea. All goods moving through the change-of-gage points must be transferred to freight cars of the receiving country since rolling stock trucks are interchangeable only on certain passenger cars. Development work on an automatic dual-gage wheelset, carried on for many years, apparently has been discontinued. The U.S.S.R. allotted 2,000 two-axle, 4'8 1/2"-gage cars to the Council for Economic Mutual Assistance (CEMA) freight-car pool among Eastern European Communist countries, but these cars play only a minor role in Soviet border traffic.

Since most of the railroad network is located in plains and lowlands, gradients are generally low; the steeper grades and most tunnels are situated in mountainous areas along the southern edges of the country. Rail operations are affected by great variations in climate, ranging from the winters of Siberia to the subtropical summers of Turkestan. Snow clearance during the long winter is often a major problem. The principal rail lines in the U.S.S.R., with some of their salient characteristics, are listed in Figure 30.

As of 1 January 1969 the network comprised 83,015 route miles of line, of which 80,374 miles were 5'0" broad gage and 2,641 miles were narrow gage, principally 2'5 1/2" (750 millimeters). Slightly over 72% of the broad-gage network is single track, and the remainder is mostly double track. Nearly 24% of the broad-gage lines have been electrified, and almost 55% use mostly diesel traction. Since 1960 the U.S.S.R. has carried out an extensive electrification and dieselization program, and in 1968 steam traction accounted for only 5.6% of the total railroad freight hauled.

Despite the high priority given the railroads during recent years, the system still suffers from years of neglect. Major reconstruction or maintenance is generally performed only on the more important routes; consequently, the track structure on many sections of line remains in poor condition because of light rails, poor-quality ballast, and inadequate maintenance and repair of the earth roadbeds. The standard rail is the T-section type; at present only the R-50 (103.8 pounds per yard), R-65 (130.8 pounds per yard), and R-75 (151.4 pounds per yard) are being laid. Rails, produced by Soviet rolling mills in lengths of 41 and 82 feet, are prewelded into 2,625-foot lengths and then laid on lines being constructed or renovated. Wooden crossties predominate and continue to be used throughout the system; prestressed reinforced concrete ties, which are preferred, are used in most new construction and in reconstruction of important routes. As of 1 January 1970, about 9,320 route miles of line had been placed on concrete ties.

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FIGURE 30. PRINCIPAL RAIL LINES

ROUTE	MINIMUM RADIUS OF		MAXIMUM GRADIENT		ROUTE	MINIMUM RADIUS OF		MAXIMUM GRADIENT	
	LENGTH	CURVATURE				LENGTH	CURVATURE		
	Miles	Feet	Percent			Miles	Feet	Percent	
Moscow-Leningrad	404	2,865	0.5		Leningrad-Lososno (Polish border)	540	971	1.6	
Moscow-Brest	683	2,200	0.8		Pskov-Zheleznodorozhnyy (Polish border)	437	na	1.0	
Moscow-Vadul Siret (Romanian border)	936	na	2.0		Riga-Khar'kov	830	722	0.8	
Bakhmach-Odessa	414	na	na		Kaliningrad-Zhlobin	466	1,844	0.8	
Moscow-Zhdanov (Mariupol)	797	1,738	1.2		Leningrad-Otrozhka	1,037	787	0.8	
Moscow-Sevastopol'	958	984	1.2		Brest-Volgograd	1,246	656	1.0	
Moscow-Baku	1,578	1,049	1.2		Zdolbunov-Mostiska (Czechoslovakian border)	170	1,436	0.8	
Ryazan'-Omsk	1,655	885	1.0		L'vov-Chop (Czechoslovakian-Hungarian borders)	165	na	2.5	
Moscow-Kurgan	1,261	1,738	0.7		L'vov-Odessa	463	1,312	0.8	
Moscow-Vladivostok	5,777	738	2.0		Razdel'naya-Ungeny (Romanian border)	140	1,916	1.1	
Moscow-Kotel'nich	504	1,738	0.7		Khar'kov-Rostov	319	1,900	0.9	
Buy-Volkhovstroy	378	na	na		Gryazi-Novorossiysk	876	1,049	1.5	
Zaudinskiy-Naushki (Mongolian border)	153	na	na		Armavir-Baku	873	1,049	2.9	
Tarskaya-Zabaykal'sk (Chinese border)	221	905	1.7		Navtlugi Pervyye-Alyat	591	869	2.9	
Dezhnevka-Sovetskaya Gavan'	499	na	0.8		Gor'kiy-Khar'kov	893	1,394	1.0	
Ussuriysk-Rassypnaya Pad (Chinese border)	72	na	na		Michurinsk-Gudermes	978	1,312	1.1	
Baranovskiy-Khasan (Korean border)	147	na	na		Penza-Syzran'	157	2,009	1.0	
Uglovaya-Tikhookeanskaya	108	na	na		Urbakh (Pushkino)-Tashkent	1,481	1,968	1.6	
Lanilov-Arkhangelsk	480	1,700	0.8		Krasnovodsk-Tashkent	1,158	1,968	1.6	
Leningrad-Severomorsk	917	1,049	1.5		Sverdlovsk-Gur'yev	971	1,394	0.8	
Leningrad-Luzhayka (Finnish border)	91	2,600	0.7		Magnitogorsk-Tayshet	1,995	1,312	0.6	
Gatchina-Tallin	201	2,100	1.0		Artyshka-Ob'	224	1,050	1.5	
					Petrovsk-Chu	941	1,312	na	
					Novosibirsk-Arys'	1,560	984	1.4	

na Data not available.

As a result of numerous waterways, the railroad system abounds in bridges. Steel-truss construction is most common for larger bridges, and steel-girder and concrete-slab for smaller bridges. Double-track bridges are uncommon because of the Soviet practice of building separate bridges for double-track lines. Tunnels are located mostly in the Caucasus and Sayan Mountains, and on the Trans-Siberian line sections around southern Lake Baykal and between Ulan-Ude and Khabarovsk. The Amur river tunnel at Khabarovsk is the only known underwater railroad tunnel in the U.S.S.R. Railroad ferries cross the Amur (Komsomol'sk-Pivan'), the Caspian Sea (Baku-Krasnovodsk), and Kerch' strait (Krym-Kavkaz). Plans call for additional routes across the Caspian (Baku-Shevchenko and others), and a connection with the island of Sakhalin (Sovetskaya Gavan'-Kholmsk). The Baku-Krasnovodsk ferry is shown in Figure 31.

The manual-block system of train control is employed on about 66% of the rail network; automatic block, supplemented by Centralized Traffic Control, is used on the remainder, including the most important lines. Locomotives operating within automatic block territory are usually equipped with cab signals and automatic train-stop devices. The principal means of railroad communication is the telephone. Strategically placed

radio stations supplement the telephone lines and serve as backup facilities in the event of line failure.

Most Soviet locomotives are powered by diesel fuel or electricity. The relatively few steam units still in service use *mazut* (a petroleum residual) or coal. Provision of water presents no difficulty.

In 1969 the railroads carried 3.042 billion short tons of freight and produced 1,617.8 billion ton-miles. In 1968 railroads carried 2.746 billion passengers and produced 157.9 billion passenger-miles. Suburban passengers, mostly commuters, purchased 88.9% of all tickets sold and accounted for 25.7% of the passenger-miles. The average length of a passenger journey was about 58 miles; commuters traveled an average of 16.7 miles each way. Gross and net weights of freight trains averaged 2,752.4 and 1,554.2 tons, respectively; freight car turnaround was 5.48 days. In 1969 the average length of freight haul was 535.6 miles. Chief commodities transported are coal and coke, petroleum, ores, ferrous metal products, lumber and other building materials, and grain.

As of 1 January 1970 the locomotive inventory totaled approximately 27,600 units: 14,600 diesel, 8,500 electric, and about 4,500 steam locomotives still in service. The Soviet-produced locomotives are technically somewhat inferior, and the inventory is

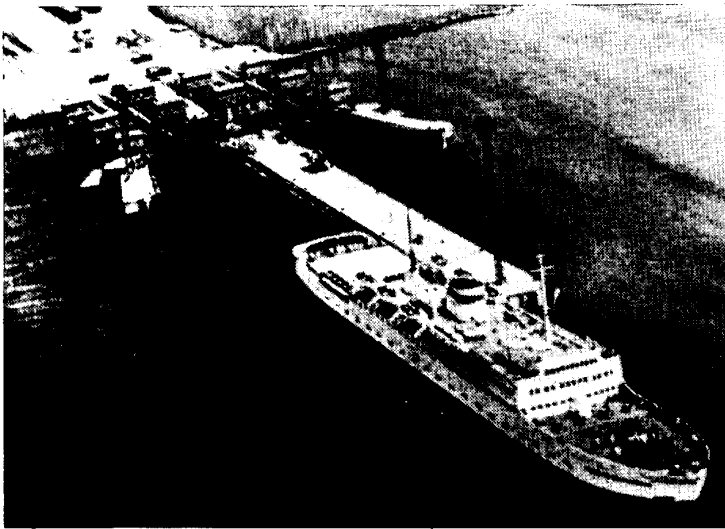


FIGURE 31. Baku-Krasnovodsk railroad ferry. One of five vessels in service is shown departing the Baku terminal. Thirty 4-axle cars can be accommodated

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inadequate to handle traffic requirements. Electric locomotive production is concentrated at plants in Novocherkassk and Tbilisi, which have an annual combined output of 300 units. Diesel production is concentrated at Khar'kov, Voroshilovgrad, and Kolomna, with a combined annual production of about 1,500 units. Additional locomotives (mostly electric) are imported from France, East Germany, Hungary, Austria, and Czechoslovakia. A Soviet-built diesel-electric locomotive, series TE 3, is shown in Figure 32.

At the beginning of 1970 the freight car inventory totaled about 1,110,000 units. The quality of freight cars is fair, but the quantity does not meet present-day demands. Approximately 95% of the inventory consists of 4-axle (or more) cars; all cars have automatic couplers and airbrakes. Domestic production of freight cars amounts to about 50,000 units annually; manufacturers are located throughout the country, but the larger plants are at Nizhny Tagil, Altayskaya, Zhdanov, and Kryukov. Soviet railroads are beginning to expand their freight containerization program. Whereas the bulk of the container park now consists of containers with a 2.5-

ton capacity, the railroads are placing emphasis on the future acquisition of 5-, 10-, and 20-ton containers.

The passenger car inventory as of 1 January 1970 was estimated at 65,000 units. Most of the passenger cars are made at Kaliningrad, Riga, and Leningrad. All-metal cars, comprising about 65% of the total fleet, are simply and ruggedly designed. Passenger equipment includes 2-, 3-, and 4-axle cars, with most of the 2-axle equipment in service on suburban lines, and the larger and heavier equipment on long-distance lines. Electric and diesel multiple-unit trains are used for local and commuter service within larger metropolitan centers.

The Soviet railroads are divided into 26 regional systems which function as independent units under the Ministry of Railways. The railroads had 2,281,000 employees in January 1969, of whom 1,968,000 were classified as operating personnel. Considerable attention is given to research, education, and training. The Central Scientific Institute of Railroad Transportation, located just south of Moscow, is probably the largest railroad institute in the country. About 14 institutes offer degrees in railroad engineering, and other railroad schools provide job training as well as basic educational courses.

C. Highways

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Highway transport in the U.S.S.R. is used primarily for short-haul movement of freight and passengers, and provides a feeder and distribution service to other modes of transport. Long-distance and interurban trucking exist on several routes, but the total amount of freight hauled in these operations is small. In 1969 highways carried an estimated 14.4 billion short tons of freight and produced 133.2 billion ton-miles. The average length of haul was 9.2 miles.

The highway network is adequate for normal requirements. Road movement and the supply of military forces would be restricted severely by the

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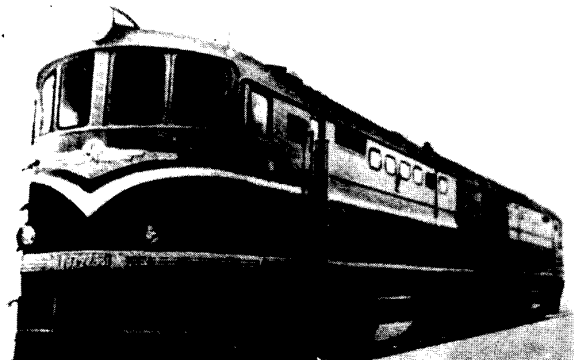


FIGURE 32. Diesel-electric locomotive, Series TE-3. This type is the backbone of the Soviet locomotive fleet.

insufficient number of paved roads, the low capabilities of secondary roads, physical bottlenecks, and adverse terrain and climatic conditions.

The unevenly distributed national network ranges from the relatively dense net in the European U.S.S.R. to the very sparse network in the Asiatic U.S.S.R. Most paved or improved roads are located in the central and western parts of the European U.S.S.R., and along the southern border. The north-central and northeastern regions of the country have few roads. The Pacific coastal region and Sakhalin island are served by several improved roads. No continuous paved road crosses the country in an east-west direction.

The U.S.S.R. road network makes connections with all bordering countries. The network density of 0.1 mile of highway per square mile is less than the densities in countries along the western border; about equal to neighboring Communist China, Mongolia, and Turkey; and greater than that of Iran and Afghanistan. From the standpoint of quality, the countries along the western border have superior roads, while the countries along the southern border have equal or inferior roads. The U.S.S.R. has an estimated 934,000 miles of highway. An approximate breakdown of this mileage by surface type is as follows:

SURFACE	MILEAGE	PERCENT OF TOTAL
Paved (concrete; bituminous—including surface treatment; stone block; cobblestone)	99,000	10.6
Crushed stone, gravel	266,000	28.5
Earth (including unimproved roads and tracks)	569,000	60.9

U.S.S.R. highways are classified administratively into five categories: all-union, republic, *oblast*, *krai* or autonomous republic, and local or rural. Although the administrative classification of roads does not signify any particular type of road construction, the all-union highways are generally paved. All-union highways comprise less than 10% of the total highway mileage.

Most main routes in the European U.S.S.R. have bituminous surfaces 16 to 23 feet wide, with 3- to 10-foot earth or gravel shoulders. Several routes have surfaces 30 to 40 feet wide. Four-lane divided highways are

limited to the Moscow circumferential highway, and to some short approach roads leading to large urban areas. In the Asiatic U.S.S.R. most main routes are constructed of crushed stone or gravel and are 16 to 20 feet wide. Bituminous surfaced roads 18 to 20 feet wide connect the more important cities in Soviet Central Asia.

Bituminous roads generally have a surface thickness of less than 2 inches laid on a crushed stone, gravel, or sand base 10 to 20 inches thick, depending on the condition and type of subsoil. The surface of gravel roads in areas of stable soil and good drainage usually consists of 2 inches of gravel and sand; elsewhere the gravel or crushed stone roads range in thickness from 4 to 12 inches and have a base of large rocks, slag, or rubble. Improved earth roads are usually constructed by grading and rolling the natural surface. Earth shoulders are predominant throughout the road network, but the better roads have gravel shoulders from 3 to 10 feet wide.

Curves and grades on the roads are generally determined by the terrain. In the flat to rolling terrain of the European U.S.S.R., the roads have gentle curves and grades. In the Caucasus and the mountainous southern border areas, many roads have steep grades and sharp curves (Figure 33).

Information is not available on the total number of highway bridges in the U.S.S.R. Timber bridges, although common on secondary and local roads, are gradually being replaced by prefabricated, reinforced concrete, deck-type bridges. Steel structures are used mainly in large urban areas and at wide-gap river crossings. Several cities have double-deck combination rail-highway bridges. Load capacities of bridges vary considerably. Recently constructed reinforced concrete bridges each have a load capacity of approximately 66 short tons under controlled speeds and spacing of vehicles; however, low-capacity bridges (less than 10 short tons) still exist on many roads. Reinforced concrete, steel, and masonry bridges are in fair to good condition, but the timber bridges are generally in poor condition.

There are few highway tunnels and galleries, and the small number of ferries and fords are usually limited to secondary road crossings. Known tunnels and galleries

FIGURE 33. Mountain road. Typical route in the Caucasus winds between Tbilisi and Ordzhonikidze.



are of reinforced concrete construction. Ferry craft vary from cable-operated barges with a capacity of one or two vehicles, to modern, diesel-powered craft with a capacity of at least 25 vehicles.

Highway construction and maintenance are government controlled. The Main Administration for the Construction of Roads and Highways (*Glavdorstroy*), subordinate to the U.S.S.R. Ministry of Transport Construction, is responsible for the planning, design, and construction of all-union highways and other roads of military significance. Planning and construction of the other roads, and the maintenance of roads, is carried out by units of the Ministry of Motor Transport and Highways in each republic, with subordinate directorates at *kray* and *oblast* level. In addition, some industries and enterprises build and maintain roads to serve their own needs.

Highways are constructed by mechanized groups assigned to specific road construction districts. Road maintenance and repair are performed by permanent units (Road Repair Points) of 25 to 35 men responsible for sectors 30 to 55 miles in length. Supplementary sources of labor include military personnel and members of collective and state farms, industrial enterprises, and other economic organizations. In general, roads are slowly and poorly built.

Many problems bar effective and efficient road construction and maintenance. There is a general shortage of appropriated funds, road construction materials, roadbuilding equipment, and skilled personnel. Moreover, mountainous terrain, unstable soils, and poor drainage hinder construction and maintenance in many areas. Road construction materials, in particular suitable gravel and crushed rock, are in short supply in some parts of the country, and must be transported to construction sites—at times by rail over long distances. Bituminous materials are available in adequate amounts; portland cement, although sufficient in quantity, is used only in the construction of especially important roads.

Under the 1966-70 Five Year Plan the Soviet Union has built or reconstructed over 40,000 miles of roads. Most of the highway projects involved widening and resurfacing of the existing road net; however, new construction of several long-distance trunk routes of economic and military importance continues. Significant new roads under construction include the following: Tambov to Volgograd, Leningrad to Murmansk, and Poltava to Kishinëv. Some of the important routes under reconstruction are the Tselinograd-Chelyabinsk, Penza-Saratov, and Vil'nyus-Kaunas highways. In addition to the road improvements, several large and significant bridges were constructed. A typical example of a Soviet bridge at a major crossing is shown in Figure 34.

Highway operations are greatly hampered by climatic conditions. Most traffic interruptions occur during periods of prolonged rain, especially in spring and autumn, when many secondary roads become muddy and virtually impassable. During dry periods

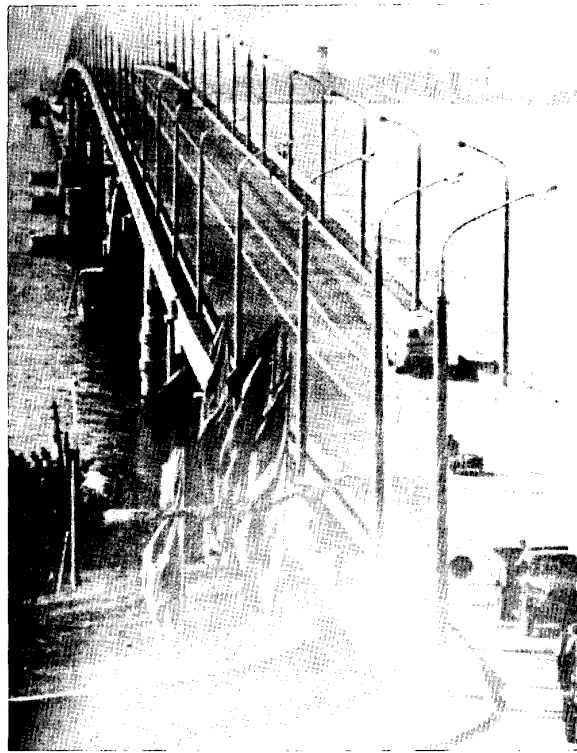


FIGURE 34. Bridge over Volga at Saratov. This is one of the largest highway structures more recently completed.

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dust conditions prevail on earth, gravel, and crushed-stone roads. In winter, freezing temperatures, icing conditions, and snowdrifts obstruct vehicle movement on most roads. In northern regions permafrost damages bridges, roads, and culverts. Roads in mountainous areas have numerous sharp curves, steep grades, and narrow and low-capacity bridges, and are subject to snow blockage and spring washouts.

Motor transport services are provided by transportation units administered and controlled by each republic ministry of motor transport and highways. Buslines connect most population centers. Some governmental agencies and the larger industrial organizations maintain motor vehicle fleets to serve their own needs. The principal types of freight hauled consist of industrial cargo, construction materials, fuel, agricultural products, and consumer goods.

As of 1 January 1970 the U.S.S.R. motor vehicle inventory was estimated at 5,810,000 units, comprising 4,510,000 trucks and buses and 1,300,000 passenger cars. Many of the vehicles are of recent manufacture, and are in fair to good condition. The U.S.S.R. produces its own vehicles, but a small number of special-purpose vehicles, buses, and motorcycles are imported from Communist East Europe. The Soviet Union is engaged in modernizing and greatly expanding its motor vehicle industry. The Italian FIAT motor company is equipping an automobile plant in the U.S.S.R. The planned output is to be 600,000 units per year when full production is

reached, probably by 1975. The French Renault motor company has also contracted to rebuild the Moscow Light Car Plant. Renovation was scheduled for completion in 1969. The annual production is to be 200,000 cars.

D. Inland waterways

The Soviet inland waterways are becoming an increasingly important segment in the national transportation pattern. The rivers, canals, lakes, and reservoirs, many of which in the European U.S.S.R. are interconnected, are militarily and commercially significant for large-scale, long-haul, bulk-commodity transportation. They also provide high-capacity lines of communication between widely separated and often economically diverse areas, especially in the Siberian U.S.S.R. The construction of new facilities and the reconstruction of older ones have helped create a unified waterway network interconnecting the major centers of population, industry, and transportation in the European U.S.S.R. The continued development and use of new, modern craft, capable of both inland and maritime navigation, greatly enhances the economic and military role of the Soviet river fleet.

The U.S.S.R. waterway system comprises some of the world's largest inland lakes and longest rivers, with nearly 25 streams ranging in length from 1,000 to 2,700 miles. Excluding Caspian Sea route mileage, the waterways suitable for navigation have a total length of

approximately 89,000 miles, greatly exceeding the total length of navigable waterways in any other country of the world. The 35 principal waterways, grouped in seven large systems and an individual river, provide almost 27,500 miles of primary navigable routes (Figure 35). The European U.S.S.R. is served by 20 25X1way components with 9,204 miles of navigability. In south-central Asian U.S.S.R. the principal routes include the 1,281-mile Aral Sea-Amudarya waterway, and the partly completed 492-mile Karakum Canal. The Siberian land mass is served by the Kolyma river and four large systems with 12 waterway components providing 16,377 miles of principal navigation. The navigability of the selected systems and the Kolyma are as follows:

WATERWAY	NAVIGABLE LENGTH Miles
European U.S.S.R.:	
Dnepr system	1,722
Greater Volga system	7,482
Central Asian U.S.S.R.:	
Aral Sea-Amudarya system (including Karakum Canal)	1,773
Siberian U.S.S.R.:	
Ob-Irtysh system	4,722
Yenisey system	4,159
Lena system	3,364
Amur system	2,974
Kolyma	1,158

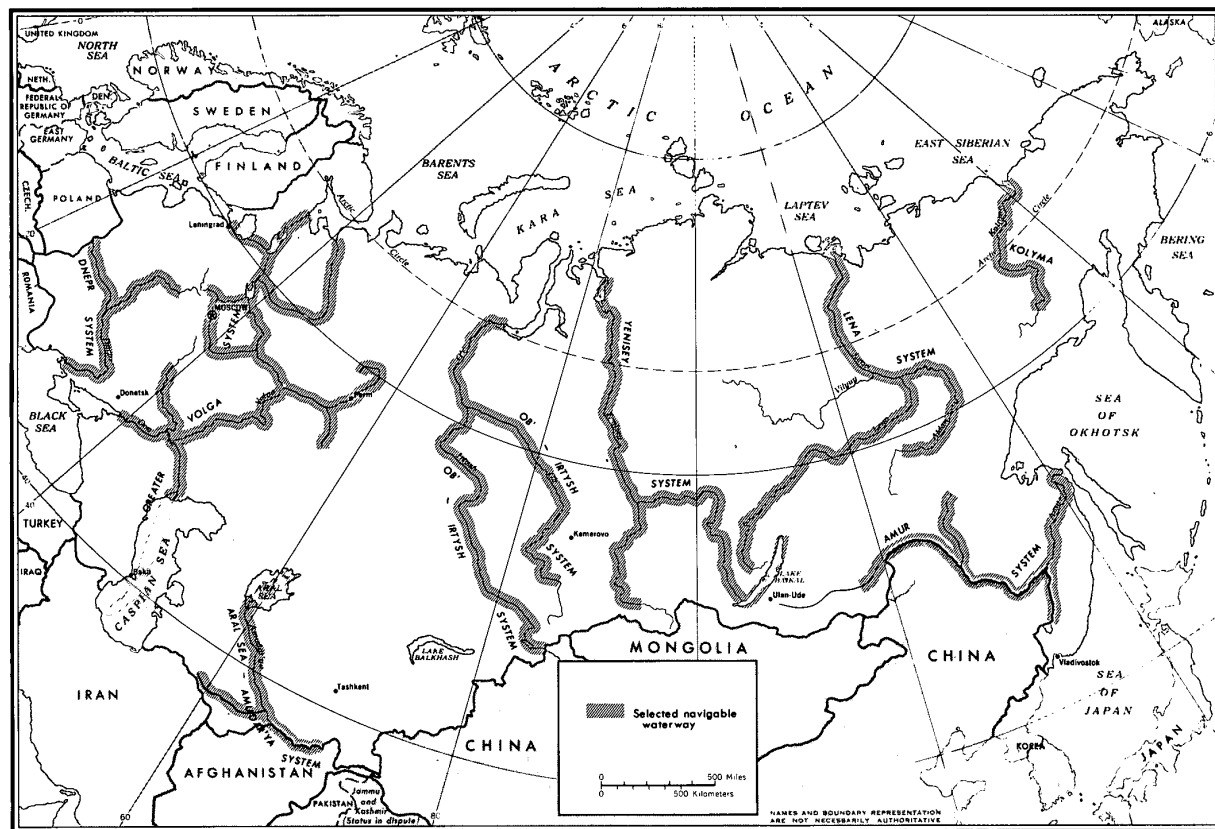


FIGURE 35. Inland waterway system

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Although primary routes represent slightly less than one-third of the total Soviet navigability, they accommodate 95% of the yearly waterway tonnage. In 1969 inland waterway vessels moved 365 million short tons of cargo and generated 109.5 billion short-ton-miles. Passenger vessels transported over 150 million persons. Sand, gravel, and other construction materials constitute about 50% of the total traffic, rafted and shipped timber and lumber about 25%, and crude oil, coal and ores, grain and other foodstuffs, and general cargo the remaining 25%. In 1968 the average length of haul for bulk commodities approximated 300 miles.

The major international connections include the following: jointly shared sections of the Amur and the Ussuri with Communist China; the upper Amudar'ya, forming part of the common boundary between the U.S.S.R. and Afghanistan; and the jointly shared Soviet-Iranian Caspian Sea. Minor connections to Poland and Communist China are made via the Pripyat waterway and the upper Irtysh, respectively. Soviet access to central Europe from the Black Sea is available on the Communist-controlled international Danube. Joint Soviet-Finnish control is exercised over the Saymenskiy Canal, a route crossing the international border northwest of Leningrad.

In the European U.S.S.R. the Greater Volga system provides heavily trafficked access to, exist from, and transit between the most industrially advanced and urbanized areas west of the Ural Mountains. The system currently accommodates the completely internal passage of fully loaded 2,000-ton Baltiyskiy class and 2,700-ton Volga-Balt class river-sea vessels between the Baltic, White, Black, and Caspian Seas; 5,000-ton Volga-Don class carriers can operate fully loaded only between the Caspian and Baltic Seas. On an east-west axis the Greater Volga system connects the Moscow complex with the industrial ports of Perm' and Ufa in the Ural foothills.

In Siberia most of the waterways form lengthy, deep-draft, north-south routes. Excluding Yakutsk, the major inland ports are located south at river intersections with the Trans-Siberian railroad; most have been developed as key transshipment points for goods destined northward. The increasing tonnages handled by these terminals, and the steady addition of 2,000- and 2,700-ton self-propelled vessels to the river fleets, reflects the essential supply service provided by the waterways in the exploration and industrial development of northern Siberia. The waterways also have assumed a major role in the current exploitation of petroleum and natural gas resources in western Siberia.

On the principal waterways, and especially those of the European U.S.S.R., traffic moves continuously day and night. Vessel movements and traffic-flow patterns are subject to controls and prearranged schedules, the strict adherence to which is considered essential. Operations are aided by an extensive and well-maintained system of floating and shorebased navigation aids and regional vessel-cargo dispatcher systems. The use of radar, ship-to-shore radio, and

radiotelephone equipment is continually expanding. An increasing proportion of freight is being hauled by self-propelled dry- and liquid-cargo barges, mainly in the 600- and 2,000-ton classes. However, a radical change in self-propelled operations is expected as the fleet is augmented by new 2,000-, 2,700-, and 5,000-ton barges capable of river-sea navigation. In tug and dumb-barge operations the trend continues toward a complete realization of push-towing. Most new tugs are pusher units with automatic coupling devices; some older tugs have been adapted for this method of operation.

The primary traffic interruption factor is ice, which may suspend operations for periods of ¹/₂ to 9 months. Operations are further curtailed by periods of drift ice, preceding the freeze and following the spring thaw. On unregulated waterways the operations are hindered by seasonal reductions in water level, extreme flooding, excessive shoals and silting, and shifting navigation channels. Generally the middle and lower sections of the larger rivers are broad with meandering courses, multiple channels, and shoals. Nearly all have annual floods, although seasonal variations have been greatly reduced on rivers regulated by dams. On open lakes and reservoirs navigation is occasionally suspended because of strong winds and heavy wave action.

Structures on the principal waterways include dams, locks, bridges, safety gates, and ornamental arches. Thirty-three dams are operational, seven are in various stages of construction, and several more are planned. The significant concentration is in the European U.S.S.R., where dams have canalized lengthy sections of the Dnepr river and the Greater Volga system, creating stable reservoirs suitable for deep-draft navigation. There are 99 lock installations, three of which are in Siberia and the remainder in the European U.S.S.R. The well-constructed and efficiently operated locks range from those with single chambers to large installations comprising two parallel rows each with six tandem chambers. In addition, one of the world's largest shiplifts—capable of transporting 2,000-ton vessels—is nearing completion on the Yenisey at the Krasnoyarsk dam. None of the bridges crossing the principal waterways imposes any restrictions on normal vessel operations.

Ports serving the waterway system include inland ports and those with a joint maritime-river function. Excluding nine significant maritime-river ports, the principal waterways are serviced by 30 major inland ports—23 in the European U.S.S.R., six in Siberia, and one in south-central Asian U.S.S.R. All are suitably equipped with quayage, handling facilities, open storage, and clearance facilities. Significant features of most major ports include: a high degree of standardization in handling facilities; the use of floating equipment; the division of ports into sections for handling specific cargoes; and night operations. Each major port transfers over a million tons annually. Year-round port activity is increasing as a result of stepped-up rail operations in the winter months, especially for containerized cargo. Several of the larger

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ports use icebreakers to maintain intraport traffic in winter. Factors adversely affecting port operations, often creating 2-week unloading delays, include a shortage of railroad cars in peak demand periods, freight accumulation, and a generally inefficient allocation and use of manpower and equipment.

In terms of cargo turnover and facilities, the major inland ports are: Zaporozh'ye, Dnepropetrovsk, and Kiyev on the Dnepr; Astrakhan', Volgograd, Saratov, Kuybyshev, Tol'yatti, Ul'yanovsk, Kazan', Gor'kiy, Yaroslavl', and Rybinsk on the Volga; Cherepovets on the Volga-Baltic waterway; Baku, Krasnovodsk, and Makhachkala on the Caspian Sea; Ust'Donetskiy, Rostov, and Tsimlyansk on the Don; Perm' on the Kama; the Moscow complex served by Yuzhnyy, Zapadnyy, and Severnyy ports; Kotlas on the Severnaya Dvina; Termez on the Amudar'ya; Omsk on the Irtysh; Novosibirsk on the Ob'; Krasnoyarsk on the Yenisey; Ust'-Kut and Yakutsk on the Lena; and Khabarovsk on the Amur. Facilities at Krasnoyarsk are shown in Figure 36.

The Soviet inland fleet is comprised of approximately 15,000 craft, of which an estimated 13,800 are cargo carriers and 1,200 are passenger vessels. At least 6,000 units are operational in the European U.S.S.R., including the Soviet Danubian fleet, and 9,000 units on the Siberian waterways. The R.S.F.S.R. fleet comprises approximately three-fourths of the total inventory, and is probably representative of the fleet as a whole. In 1968 the self-propelled dry cargo vessels accounted for 29.5% of the carrying capacity, the self-propelled tankers 24.2%, and the dry- and liquid-cargo dumb barges 46.3%. The average capacities of the larger self-propelled classes were 1,060 tons for dry-cargo craft and 1,530 tons for tankers. The larger dry-cargo and tanker

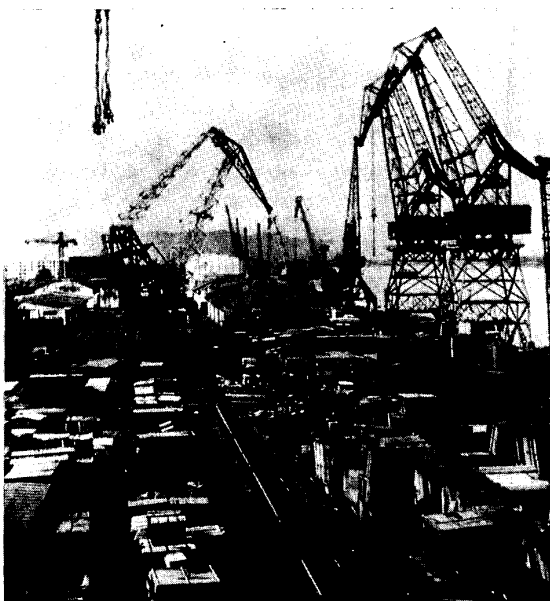


FIGURE 36. Krasnoyarsk port on the Yenisey. Extensive transshipment facilities typify major river junctions with the Trans-Siberian railroad.

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dumb barges averaged 1,000 and 2,630 tons, respectively. Tugs averaged 363 h.p. for the larger classes, and 250 h.p. for the smaller units. Although 2,000- and 4,000-h.p. diesel push tugs are being serially produced, small steam driven units represented 29% of the R.S.F.S.R. towing fleet in 1968. In an effort to further standardize and modernize the inland fleet, the serial production of river vessels is now restricted to 57 basic classes. Of these, the prototypes of 27 have already completed lengthy testing. The principal self-propelled dry-cargo vessel in the fleet will be the 2,700-ton river-sea units (Figure 37).

The administrative and operational control of inland waterway transportation is directed by the Ministry of River Fleet, R.S.F.S.R., and by directorates of river shipping in the Council of Ministers of other union republics. There are 29 inland shipping companies in the country. Two additional companies, operating on the Caspian Sea and on the Aral Sea-Amudar'ya system, are subordinate to the Ministry of Maritime Fleet of the U.S.S.R. The shipping companies are organized on river or river basin lines, and, except for tugs, the vessels of one company operate within the territorial jurisdictions of other companies. There are 14 basin/canal administrations which manage and maintain all waterway routes and associated structures.

Earlier development plans for the waterways are gradually being realized with the completion of new dams, river dredging, the development of new ports and repair facilities, the enlargement of existing facilities, and the increasing use of push-towing and large river-sea craft. The completion of some programs in the European U.S.S.R. will provide uninterrupted navigation for river-sea vessels up to 5,000-ton capacity between the Black, Caspian, and Baltic Seas. In port operations the emphasis is on mechanization and containerization. The Siberian rivers are to increasingly supplement the Northern Sea Route support to establishments above the Arctic Circle. Dams with locks are reported under construction at Kanëv on the Dnepr, Cheboksary on the Volga, Nikolayevskaya on the lower Don, and Naberezhnyye Chelny on the Kama. Construction on the Karakum Canal continues near Ashkhabad. Work on the Krasnoyarsk shiplift is behind schedule, and it may not become operational until late 1971. In Siberia dams are under construction at Zeya on the Zeya, Shushenskoye on the Yenisey, and near Ust'-Ilimsk on the Angara.

Construction may soon begin on two major projects long under consideration. The first is a canal connecting the Amur near Mariinskoye with Tatar Strait via Lake Bol'shoye Kizi. Reportedly the route has been surveyed, but as yet there is no evidence of actual construction. The second project will reverse the northward flow of the Pechora by a series of dams and canals. The water will flow southward via the Kama and Volga, and hopefully arrest the rapidly falling level of the Caspian Sea.

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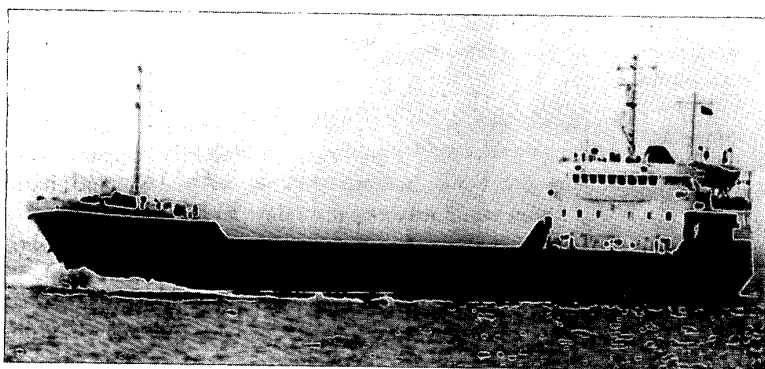


FIGURE 37. Sormovskiy class river-sea vessel. The 2,700-ton craft are a newer version of the 2,000-ton Baltiyskiy class

25X1

E. Pipelines

The development of pipeline systems in the Soviet Union has been an important adjunct to the rapid expansion of the oil and gas industries. The increased domestic demand, together with the importance of petroleum exports as a major earner of foreign exchange credits and the relatively low cost of developing new oil and gas discoveries, has induced the government to assign a high priority to increasing the output of crude oil and natural gas.

The construction of new pipeline systems has not kept pace with increased production, and the necessity of transporting petroleum long distances has caused a strain on the country's rail facilities. The current Five Year Plan (1966-70) calls for increased movement of petroleum by pipeline and less dependence on the railroads for transportation. At the present time natural gas production exceeds the transportation capability of the gas pipeline networks, and the construction of additional natural gas lines has first priority in pipeline development plans. Despite ambitious programs to lay new lines to handle an increased production of crude oil, additional networks must also be constructed to move the crude oil efficiently.

The total length of all petroleum pipelines was only 9,038 miles in 1958. In 1970 the total length of crude-oil pipelines alone is estimated at 25,000 miles, while refined product pipelines total about 7,000 miles.

A primary effort is being made to complete the large-diameter CEMA (Figure 38) pipeline system for transporting crude oil from the Urals-Volga oilfields to refineries in western U.S.S.R., Poland, East Germany, Hungary, and Czechoslovakia. The main portions of this 2,700-mile-long pipeline system were operational in 1965, but pumping limitations and operational problems did not permit operation of the system at its designed capacity. To correct this deficiency, new pumping stations have been built and existing pumping stations are being expanded. The designed capacity of the CEMA system will be further increased when the work now underway to double the line is completed. A 453-mile segment of parallel line has recently been completed between Mozyr', U.S.S.R., and Czechoslovakia. Another crude-oil pipeline system is under construction in Tyumenskaya Oblast'. When com-



FIGURE 38. The CEMA pipeline. The first section of the now completed line is shown under construction near the U.S.S.R.-Poland border

25X1

pleted, the system will exceed 1,700 miles in length and bring oil from fields near the Ob' river to refineries at Omsk, Tomsk, and Angarsk. A crude-oil pipeline between Irkutsk and the Pacific Ocean port of Nakhodka has been proposed, but its construction is contingent upon an agreement with Japan to supply pipe in exchange for crude oil.

In the U.S.S.R. the availability of pipeline capacity has directly affected the natural gas production in various producing areas, and has determined regional patterns of the distribution and consumption of gas. The total length of natural gas transmission lines increased from 29,500 miles in 1966 to about 40,000 miles in 1970.

Use of large pipe, as much as 48 inches in diameter, has substantially aided the exploitation of gasfields, but the remoteness of gas-producing areas from the primary consuming centers has made it necessary to construct the pipelines over long distances. Examples of this are found in the large-diameter lines leading from gasfields in the Stavropol' area to Moscow, and the lines from the Bukhara and Gazli gasfields to Moscow and industrial centers in the Urals. A 2,000-mile-long natural gas pipeline system of special importance is under construction in the northern part of Tyumenskaya Oblast'. Designated the Northern Lights system, it will include pipe 56 inches in diameter and will bring to the

Moscow area gas from the frozen reaches of northwest Siberia. Extensions from the Northern Lights system are planned to other Communist as well as Western countries.

Details of selected pipelines for handling crude oil, refined products, and natural gas are given in Figure 39.

F. Ports

The U.S.S.R. has 60 major ports, 119 minor ports of some significance, and numerous others too small to be of more than local importance. The major and minor ports are distributed among the following four coastal maritime areas:

	MAJOR	MINOR
Black Sea coast	17	23
Baltic coast	12	24
Pacific coast	16	55
Arctic coast	15	17

Each maritime area has its own merchant and naval fleets, and operates its own port system. The Baltic and Black Sea areas have the greatest concentrations of ports and port activity, and most U.S.S.R. maritime trade is carried on from there. The Baltic and Black Sea ports serve heavily industrialized and populated regions of the U.S.S.R., and have the best rail, road, inland waterway, and cross-country pipeline clearance facilities.

With the exception of Leningrad, the larger Soviet commercial ports do not compare in size or extent of facilities with the major ports of other leading maritime nations; nor have the Soviets kept abreast of modern maritime trends, such as adoption of the containerization method for speeding up cargo-handling operations. Inadequacies such as the lack of deep-water berths and approaches, lack of oil bunkering and storage terminals, and lack of railroad cars have at times hampered port operations and caused ship delays; however, the U.S.S.R. is striving to improve the situation in order to better meet the needs of their rapidly expanding merchant marine.

Maritime shipping and the ports occupy a key place in the Soviet transportation system. In many instances the Soviets have found it more economical to move their freight by sea rather than overland, even though the sea distance might be twice that via other means. Plans called for 18.6% of the total volume of freight for 1970 to be shipped by sea through the maritime ports.

Soviet ports still rely heavily on direct cargo transfer between rail cars and ships, and any interruption to the rail service adversely affects port operations. Most cargo is handled directly alongside the wharves, and little lightering is carried on from anchorages or moorings. Rapid-handling wharf cranes are used extensively; ship's gear is seldom employed. Many Soviet ports, and particularly those of a naval character or those where sensitive military activities are performed, are not open to non-Communist shipping. U.S.S.R. ports are affected more by weather and climate than those of any other

large maritime power—ice constituting the most serious obstacle. Almost half the coastal waters are unnavigable for part of the year, and many ports are closed during winter. The most favorable climatic conditions exist in the Black Sea, where the ports are usually operational year round. Most ports are predominantly commercial in nature, a few are exclusively naval, and many commercial ports provide some degree of support for the naval forces as operating bases or shipbuilding/ship-repair centers.

The Black Sea area, site of major European U.S.S.R. transport facilities, handles about 50% of the total seaborne trade. Most post-World War II port development has taken place in this area. Several ports have been considerably improved with new and deeper wharves, new storage terminals, ship-repair facilities, and handling equipment; Il'ichëvsk, a fairly large port, is newly built. Novorossiysk, Odessa, and Il'ichëvsk are the most significant Black Sea commercial ports, together handling about 40 million tons of cargo annually. One of the largest supertanker terminals in Eurasia recently became operational at Novorossiysk. Nikolayev is the largest, most important shipbuilding center in the area, followed by Kerch' and Kherson. The best commercial ship-repair facilities are at Odessa and Il'ichëvsk. Sevastopol'/Balaklava has the finest natural harbor in the Black Sea, and is the area's principal naval base, Soviet Black Sea Fleet headquarters, and the most important naval ship-repair and supply port; several other ports have small logistical support bases or minor naval facilities. Black Sea naval ports provide logistic support for maintaining Soviet naval presence in the Mediterranean Sea. Zhdanov is a principal exporter of coal, and Novorossiysk, Batumi, Feodosiya, and Tuapse are primarily oil-shipping ports. Kerch' and Poti are mainly ore-shipping ports, while Yalta, Sochi, and the minor port of Sukhumi are noted health resorts. Reni and Izmail, in addition to Kherson, are important exchange ports for the transshipment of cargoes between oceangoing and river vessels. Ports open to non-Communist shipping are Batumi, Novorossiysk, Zhdanov, Odessa, Il'ichëvsk, Tuapse, Poti, and the minor port of Sukhumi. Most military and commercial cargoes destined for Cuba, North Vietnam, the United Arab Republic, and other Arab countries originate from Black Sea ports.

Soviet Baltic ports occupy a favorable position with respect to a populous industrial hinterland. Significant tonnages of general cargo, oil, coal, grain, lumber exports, and fish products are handled in the area. Leningrad is the nation's premier commercial port, a leading industrial center, the transportation hub of the Soviet Baltic area, and the U.S.S.R.'s most important shipbuilding and naval training center. The port is a gateway to the Baltic, and principal entrance to the inland waterway system interconnecting the Caspian, Black, White, and Baltic Seas. The naval base at nearby Kronshtadt guards the approaches to Leningrad. Baltiysk is the principal naval operating base for the Baltic Fleet, and nearby Kaliningrad is both naval

FIGURE 39. SELECTED PIPELINES

TERMINALS		LENGTH	DIAMETER	PRODUCTS TRANSPORTED	THROUGHPUT CAPACITY*	REMARKS
From	To					
Kuybyshev	Unecha	Miles 823	Inches 40	Crude	800,000	Main trunk line of CEMA (Friendship) pipeline system. Known pump stations at Kuybyshev, Syzran', Kuznetsk, Penza, Michurinsk, Bryansk, and Unecha.
Do	do	823	48	do	**1,200,000	Parallel line, under construction.
Unecha	Mozyr'	183	32	do	540,000	CEMA system. Known pump station at Gomel'.
Do	do	183	na	do	na	Parallel line, under construction.
Mozyr'	Soviet-Polish border (near Brest)	297	24	do	240,000	CEMA system. Known pump stations at Mozyr', Turuv, Pinsk, Kobrin, and Brest.
Do	do	297	na	do	na	Parallel line, under construction.
Do	Soviet-Czechoslovak border (near Uzhgorod)	453	21	do	160,000	CEMA system. Known pump stations at Ovruch, Brody, and Uzhgorod.
Do	do	453	28	do	**320,000	Parallel lines. Section from Brody, U.S.S.R., to Czechoslovakia-U.S.S.R. border reported complete. Section from Brody to Mozyr' under construction.
Unecha	Polotsk	234	28	do	360,000	Known pump stations at Unecha and Gor'kiy.
Polotsk	Šiauliai	217	24	do	240,000	Known pump station at Polotsk.
Šiauliai	Ventspils	155	16	do	120,000	Planned.
Do	Klaypeda	124	16	do	120,000	
Al'met'yevsk	Kuybyshev	170	32	do	340,000	
Do	do	170	na	do	na	Parallel line.
Do	do	170	na	do	na	Do.
Do	Gor'kiy	360	21	do	160,000	Known pump stations at Al'met'yevsk, Vorotynets, Tin'govatovo, Mikhaylovka, and Kovali.
Do	do	360	32	do	480,000	Parallel line.
Do	do	360	**32	do	**480,000	Do.
Do	do	360	na	do	na	Parallel line, under construction.
Gor'kiy	Yaroslavl'	245	28	do	340,000	
Do	do	245	na	do	na	Parallel line.
Gor'kiy	Ryzaan'	260	28	do	340,000	
Do	do	260	na	do	na	Parallel line, under construction; expected completion date na.
Ryazan'	Moscow	125	24	do	240,000	
Al'met'yevsk	Perm'	279	14	do	83,000	Known pump station at Dryakhly.
Kuybyshev	Saratov	275	20	do	160,000	
Saratov	Volgograd	360	21	do	160,000	
Do	Astrakhan'	521	16	do	100,000	Eight pump stations reported, locations na.
Volgograd	Tikhoretsk	313	28	do	324,000	Known pump station at Tikhoretsk.
Tikhoretsk	Novorossiysk	150	21	do	160,000	
Do	Tuapse	150	21	do	160,000	
Armavir	do	138	12	do	70,000	Known pump station at Kura.
Al'met'yevsk	Tuymazy area	62	21	do	151,000	
Do	do	62	28	do	340,000	Parallel line.

25X1

Kuybyshev	Tuymazy area	**220	14	do	**83,000	Known pump station at Pokhvistnevo.
Do	do	**220	32	do	**340,000	Parallel line.
Romashkino	Kuybyshev	150	21	do	151,000	
Tuymazy area	Omsk	827	21	do	120,000	Known pump stations at Tuymazy, Suslovo, Kropachévo, Cherkassy, Yurgamysh, Bulayevo, Yazykovo, Kurgan, Travniki, Kolesnikov, Asha, Berdyaush, and Chernikovsk.
Do	do	827	28	do	300,000	Parallel line.
Do	do	827	32	do	380,000	Do.
Do	Ishimbay	203	na	do	na	
Shaim	Tyumen'	267	21	do	31,000	Known pump station at Kuminskiy.
Voy-Yozh	Ukhta	100	na	do	na	Planned; expected completion date, na.
Uss	Yaroslavl' (via Ukhta)	**600	na	do	na	
Ishimbay	Orsk	209	21	do	na	
Gur'yev	do	443	12	do	60,000	Known pump station at Gur'yev.
Uzen'	Fort-Shevchenko	87	20	do	na	
Do	Gur'yev	250	40	do	na	Under construction; completion expected by end of 1971.
Makat	Kuybyshev	475	40	do	na	
Baku	Batumi	546	10	do	34,000	
Do	do	515	28	do	na	
Makhachkala	Groznyy	100	8	do	30,000	Known pump stations at Makhachkala, Temirgoye, and Gudermes.
Do	do	100	**12	do	na	Parallel line.
Malgobek	Tikhoretsk	310	na	do	na	
Ineni Dvadsati Shesti Bakinskih	Krasnovodsk	113	na	do	na	
Komissarov	do	113	na	do	na	
Do	Irkutsk	1,500	28	do	340,000	Known pump stations at Omsk, Nizhneudinsk Uyar, Klyukvenskiy, Kashtan, Krasnoyarsk, and Oktyabr'sk.
Omsk	do	250	32	do	151,000	Known pump station at Abatskiy.
Ust'-Balyk	Pavlodar	625	40	do	na	
Aleksandrovskoye	Omsk	**156	**28	do	na	Under construction; completion expected in 1972.
Do	Ust'-Balyk	621	48	do	na	Planned.
Anzhero-Sudzhensk	Anzhero-Sudzhensk	**140	na	do	na	Do.
Bogotol	Bogotol	2,188	na	do	**63,000	Parallel line.
Nakhodka	Nakhodka	390	12	do	na	
Komsomol'sk	Komsomol'sk	390	**17	do	na	
Do	do	181	na	do	na	
Komsomol'sk	Khabarovsk	5	na	do	na	
Galati, Romania	Reni	313	na	Refined	na	Planned.
Moscow Ring Enclosure	Moscow Ring Enclosure	125	na	do	340,000	Under construction; completion scheduled 1971.
Ryazan'	Moscow	410	28	do	150,000	
Kremenchug	Odessa (via Kherson)	724	20	do	54,000	Planned.
Kuybyshev	Bryansk	313	10	do	na	
Saratov	Voronezh	124	na	do	54,000	
Minnibayevo	Kazan'	322	10	do	79,000	
Groznyy	Armavir	284	12	do	**114,000	Do.
Armavir	Nikitovka	708	**15	do	na	
Groznyy	Chapline (via Armavir)	552	na	do	na	
Baku	Batumi			do		

Footnotes at end of table.

FIGURE 39. SELECTED PIPELINES (Continued)

TERMINALS		LENGTH Miles	DIAM- ETER Inches	PRODUCTS TRANSPORTED	THROUGHPUT CAPACITY*	REMARKS
From	To					
Chelyabinsk	Tselinograd	591	na	Refined	na	Planned.
Pibani'shur	Yelabuga	169	na	do	na	na
Vologograd	Kupyansk	344	na	do	na	Under construction; completion date, na.
Ishimbay	Ufa	105	20	do	na	na
Do	do	105	12	do	79,000	Parallel line.
Ufa	Omsk	740	20	do	190,000	Do.
Do	do	740	15	do	114,000	na
Omsk	Novosibirsk	432	20	do	190,000	Planned; expected completion date, na.
Novosibirsk	Chita (via Irkutsk)	1,575	na	do	na	Do.
Skovorodino	Yakutsk	672	na	do	na	World's northernmost pipeline. Northward extension
Messoyakha	Noril'sk	250	28	Natural gas	na	under construction.
Dashava area gasfields	Soviet-Polish border	63	28	do	**12,500,000	Parallel line.
Do	do	63	12	do	na	Ultimate capacity of 12,000,000 cubic meters per day.
Do	Soviet-Czechoslovak border	115	32	do	**2,700,000	na
Ivatshevichi	Riga	324	28	do	**3,900,000	na
Dashava area gasfields	Kiyev	321	20	do	**12,500,000	na
Do	Serpukhov (via Kiyev and Bryansk)	760	20	do	**3,900,000	na
Shebelinka	Brovary (via Poltava)	305	28	do	**12,500,000	na
Poltava area gasfields	Riga (via Minsk)	580	na	do	na	Planned; expected completion date, na.
Poltava	Krivoy Rog (via Krenenchug)	**140	40/28	do	**2,700,000	na
Shebelinka	Bryansk (via Ore)	338	28	do	**12,500,000	na
Do	Moscow (via Bryansk)	**500	na	do	na	na
Do	Ostrogzhsk	150	40	do	**29,000,000	na
Do	Voroshilovgrad	160	40	do	**29,000,000	na
Torzhok	Minsk	**350	na	do	na	na
Moscow	Leningrad (via Torzhok)	**400	40	do	na	na
Shebelinka	Nikolayev (via Dnepropetrovsk)	310	28	do	11,000,000	Double pipeline to Dnepropetrovsk.
Krasnodar area	Leningradskaya area	215	32	do	**17,800,000	na
Leningradskaya area gasfields	Stavropol' area gasfields	160	na	do	na	na
Baku area	Mozdok (via Tbilisi)	480	28-20	do	**3,900,000	na
Stavropol'	Groznyy	360	28-20	do	**12,500,000	na
Leningradskaya area gasfields	Serpukhov (via Rostov)	650	40	do	**29,000,000	na
Do	Rostov No. 1	63	32	do	**17,800,000	Parallel to Leningradskaya-Rostov No. 1 line.
Do	do	63	32	do	**17,800,000	na
Stavropol' area gasfields	Moscow No. 1	813	28	do	**12,500,000	Parallel to Stavropol'-Moscow No. 1 line.
Do	do	813	32-28	do	**17,800,000	Ring pipeline serving Moscow area.
Moscow gas ring	Moscow gas ring	313	32	do	**17,800,000	na
Serpukhov	Leningrad (via Kalinin)	505	28	do	**12,500,000	Was to have been completed by 1965; status, na.
Moscow gas ring	do	395	28	do	**12,500,000	na
Vologograd area gasfields	Saratov area No. 1	230	20	do	**3,900,000	Parallel to Vologograd-Saratov No. 1 line.
Do	do	235	28	do	**12,500,000	na
Saratov area	Moscow area	470	12	do	**1,100,000	na

25X1

<i>Do</i>	Gor'kiy.....	370	40	.....<i>do</i>	**29,000,000	Reported to have 7 compressor stations.
Ufa area.....	Moscow gas ring (via Tuymazy area).....	**790	12	.....<i>do</i>	**1,100,000	
Chelyabinsk.....	Ufa.....	235	12	.....<i>do</i>	**1,100,000	
Berezovo.....	Serov No. 1.....	390	32	.....<i>do</i>	**17,800,000	Parallel to Berezovo-Serov No. 1 line; under construction; expected completion date, <i>na</i> .
<i>Do</i>	Serov No. 2.....	390	<i>na</i>	.....<i>do</i>	<i>na</i>	
Bukhara/Gazli area gasfields.....	Nizhniy Tagil (via Chelyabinsk).....	1,558	40	.....<i>do</i>	**29,000,000	Reported to have 13 compressor stations.
<i>Do</i>	Chelyabinsk.....	1,238	40	.....<i>do</i>	**29,000,000	
<i>Do</i>	Alma-Ata (via Chimkent) No. 1.....	1,150	28-20	.....<i>do</i>	**29,000,000	Parallel to Bukhara/Gazli-Alma-Ata No. 1 line; reported complete to Tashkent.
<i>Do</i>	Alma-Ata (via Chimkent) No. 2.....	1,150	40	.....<i>do</i>	<i>na</i>	
Kyzyltunshuk.....	Tashkent (via Dushanbe and Mubarek).....	**620	12	.....<i>do</i>	<i>na</i>	
Ashkhabad.....	Mayskoye.....	**250	<i>na</i>	.....<i>do</i>	**2,000,000	Under construction; expected completion date, <i>na</i> .
Sheberghan, Afghanistan.....	Dushanbe.....	**62	32	.....<i>do</i>	<i>na</i>	
Gazli gasfield.....	Moscow area.....	**2,000	40	.....<i>do</i>	**29,000,000	Central Asia-Center line No. 1.
Darvaza.....	.....<i>do</i>	**2,000	48	.....<i>do</i>	**41,000,000	Parallel to Gazli-Moscow line; under construction; expected completion date, <i>na</i> .
Iran (via Astara).....	Kazi-Magomed.....	**137	48	.....<i>do</i>	**27,000,000	Under construction; expected completion by 1971.
Serov.....	Nizhniy Tagil.....	143	40	.....<i>do</i>	<i>na</i>	
Nizhnaya Tura.....	Perm'.....	186	40	.....<i>do</i>	**25,000,000	Under construction; expected completion date, <i>na</i> .
Uzen'.....	Kuybyshev (via Gur'yev).....	**926	<i>na</i>	.....<i>do</i>	<i>na</i>	
<i>Do</i>	Fort-Shevchenko.....	87	<i>na</i>	.....<i>do</i>	<i>na</i>	
Myldzhino area gasfields.....	Novosibirsk (via Tomsk).....	**410	<i>na</i>	.....<i>do</i>	**27,000,000	Planned; expected completion date, <i>na</i> ; branch lines will supply gas to several cities to the east.
Novosibirsk.....	Karaganda (via Barnaul).....	**650	<i>na</i>	.....<i>do</i>	<i>na</i>	
Ukhta.....	Torzhok.....	857	48	.....<i>do</i>	<i>na</i>	First completed section of a planned 3,750-mile gas pipeline network extending southwest across the Ural Mountains; parallel line under construction. System will ultimately have 2 additional 56-inch-diameter pipelines and 10 compressor stations.
Vuktyl'.....	Ukhta.....	119	40	.....<i>do</i>	<i>na</i>	
Kotlas.....	Arkhangel'sk.....	**300	<i>na</i>	.....<i>do</i>	<i>na</i>	Planned; expected completion date, <i>na</i> .
Cherepovets.....	Leningrad.....	**280	<i>na</i>	.....<i>do</i>	<i>na</i>	Planned; expected completion by end of 1970.
Novyy Port.....	Ukhta.....	**635	<i>na</i>	.....<i>do</i>	<i>na</i>	Planned; expected completion date, <i>na</i> .
Okha.....	Komsomol'sk.....	**390	<i>na</i>	.....<i>do</i>	<i>na</i>	<i>Do</i> .
Okha.....	Korsakov.....	**620	26	.....<i>do</i>	<i>na</i>	<i>Do</i> .
Tas-Tumus.....	Yakutsk.....	250	20	.....<i>do</i>	<i>na</i>	Planned extension southward, possibly to Nakhodka.

na Data not available.

*Barrels per day for refined and crude oil pipelines; cubic meters per day for natural gas pipelines.

**Estimated.

headquarters and a commercial port. Riga, Liyepaya, and Tallin are also important commercial ports and naval bases. Ventspils and Klaypeda are major petroleum-shipping ports, the former at the terminus of a CEMA pipeline branch. Vyborg is a small commercial port and naval base, Pal'diski is now almost exclusively naval, and Lomonosov complements the naval base at Kronshtadt. Ports open to non-Communist shipping are Leningrad, Klaypeda, Ventspils, Riga, Tallin, and Vyborg.

In the Pacific area over 90% of the port facilities are located in southeast Siberia, in a maritime zone extending from the Amur river south to the North Korean border. This area is served by the Trans-Siberian railroad and the Amur river system, and several of its ports can be kept open year round. Vladivostok and nearby Nakhodka lie close to Japan, Communist China, and North Korea, and they dominate in carrying on foreign trade in the area. They are also supply points for Soviet Far East coastal bases and garrisons; reception points for coal, ores, minerals, timber, and furs; and large fish-processing centers. Nakhodka, built since World War II, is now the largest commercial port in the Soviet Far East. Vladivostok—the largest naval base and ship-repair center—is also an important commercial port and headquarters of the Soviet Pacific Fleet. Other ports of significance are: Petrovka, the Zaliv Strelok complex, and Sovetskaya Gavan', all of naval importance—the latter also the site of commercially important Vanino; Komsomol'sk, largest shipbuilding center in the Soviet Pacific; Nikolayevsk, gateway to the Amur river; and Mago and Lazarev, timber exporting ports. On Sakhalin the largest port is Korsakov; Kholmsk and Nevel'sk are fishing and coal-shipping ports, and Moskal'vo is a crude-oil shipping terminal. Northeast Siberia has three significant ports; Petropavlovsk-Kamchatskiy, an important naval base and operating center for missile-range instrumentation ships; Magadan, serving an important mining region; and Provideniya, the eastern terminus of the Northern Sea Route. Petropavlovsk-Kamchatskiy is open year round, but the other ports in northeast Siberia are closed for several months of the year. Nakhodka is the only Soviet Pacific port open to non-Communist shipping; however, Japanese ships occasionally call at Kholmsk, Mago, Lazarev, and the minor port of Ulegorsk.

Soviet Arctic ports lie in three distinct zones, based on ice conditions and geographic factors. The first zone, between the Norwegian border and the White Sea, is warmed by a branch of the Gulf Stream and is comparatively ice free; the ports are generally open year round. Within this zone is Murmansk, one of the two largest Arctic commercial ports, western terminus of the Northern Sea Route, the largest fishing base in the U.S.S.R., and an important naval ship-repair center. Murmansk ships equipment and supplies to polar stations, ports, mining centers, and air bases on the Northern Sea Route and in the Far East, and receives minerals and timber from other Northern Sea Route

ports. Naval ports include Severomorsk and Polyarnyy in the same inlet with Murmansk, and Pechenga, Iokanga, and a number of recently constructed ports in bays along the coast. Severomorsk is the site of headquarters for the Soviet Northern Fleet. The second zone, the White Sea, is closed by ice for as much as 6 months annually. Within this zone are: Arkhangel'sk, equaling Murmansk in commercial importance, a river-sea transshipping point, and a supply and repair base for Northern Sea Route traffic; nearby Severodvinsk, largest shipbuilding center in the Arctic; Belomorsk, a lumber-shipping port and terminus of the White Sea-Baltic Canal; Kandalaksha, serving the aluminum and sawmilling industries; and Rabocheostrovsk, a lumber port serving nearby Kem'. The third zone, between the White Sea and Bering Strait, lies along the Northern Sea Route, which is navigable only a few months each year. Ports along the route serve primarily as outlets for natural resources of the regions, provision and bunkering points for vessels traversing the route, and as bases for Soviet Arctic research groups. The most important are Dikson, Tiksi, and Pevek along the coast, and Dudinka and Igarka inland on the Yenisey river. Ports of the Arctic area listed as open to non-Communist shipping are Murmansk, Arkhangel'sk, Kandalaksha, Rabocheostrovsk, Dudinka, Pevek, Tiksi, and Dikson.

The commercial ports are administered by the Ministry of Maritime Fleet, subordinate to the U.S.S.R. Council of Ministers. The several merchant marine companies under the ministry are completely responsible within assigned geographic areas for operating the fleets, the ship-repair and commercial port facilities, and the maritime training schools. In each port the operations are controlled through a harbormaster's office; those that handle Ministry of Defense vessels, personnel, and cargoes also have a military officer assigned to the office. Many foreign-trade organizations, including the U.S.S.R. Chamber of Commerce, provide a large spectrum of port services dealing with the export and import of various specific products and commodities. At each port INFLOT (Maritime Agency for Servicing Foreign Ships in Soviet Ports) acts as agent for all foreign ships; its services include the handling of ships entering port, informing foreign vessels of local port regulations, and related shipping matters. Crew members calling at the commercial ports are referred to the ship-chandler provisioning organization, *Glavtorgmorts*. Directly subordinate to the Ministry of Maritime Fleet is *Soyuzmorniprojekt*, which plans and does research to determine development trends and desirable port projects. The Ministry of Fishing Industry supervises the fishing harbors at commercial ports, and the Ministry of Food Industry supervises shore-based fish-processing facilities.

Administrative control over naval ports is vested in the operating base commanders, who also control the fleet units assigned them and other naval activities in their region. The commanders are under the general direction of the commanders-in-chief of the four major naval fleets.

Coast Guard activities are under the jurisdiction of the Committee for State Security (KGB). The mission of a local office of the KGB Maritime Border Guard is to prevent violation of territorial waters, illegal entry or exit via Soviet waters, and smuggling; it also performs security patrol-boat reconnaissance, enforces customs regulations, conducts seaman inspections, authorizes clearances for vessel arrivals and departures, and is responsible for ship surveillance in port. Usually a two-pass system is enforced to control the movements of visiting foreign seamen.

Significant details of the 60 major ports are summarized in Figure 40. The most important of the major ports are plotted on the Terrain and Transportation Summary Map (Figure 186).

G. Merchant marine

The U.S.S.R. merchant marine ranks fourth in the number of ships and seventh in deadweight tonnage (d.w.t.) among the merchant fleets of the world. Although fleet expansion continues at the rapid rate so notable since 1960, the Soviets have failed to meet their long-range plan goals. Since 1964 the acquisition of new ships by the merchant fleet has roughly averaged 105 units with about 982,000 d.w.t. annually.

The merchant marine comprises a commercial fleet of general-service ships, and a fleet of special-service ships. On 1 July 1970 the commercial fleet had 1,335 general-service ships of 1,000 or more gross register tons (g.r.t.), aggregating 8,714,353 g.r.t. and 11,313,812 d.w.t.³ The composition was as follows:

	No.	G.R.T.	D.W.T.
Dry cargo	1,009	5,373,164	6,927,273
Passenger-cargo	13	34,239	29,952
Passenger	64	376,537	150,178
Tanker	249	2,930,413	4,206,409
Total	1,335	8,714,353	11,313,812

Since 1 January 1968 the total g.r.t. and d.w.t. have been increased by about 11% and 10% respectively. As of 1 July 1970 the fleet of 58 special-service ships (1,000 g.r.t. upward)—including icebreakers and training, scientific research, and space-event support vessels—totaled 267,442 g.r.t. and 134,299 d.w.t.

The Caspian Sea fleet, which on 1 July 1970 comprised about 75 ships totaling 247,687 g.r.t. and 293,811 d.w.t., is a valuable supplement to the oceangoing fleet. Although employed independently, and largely confined to Caspian Sea operations, ships of the fleet are frequently moved through the Volga-Don Canal and connecting rivers for oceangoing use elsewhere.

The Soviet's have increased the size of ships built since 1960; however, their average-size merchant ship of 6,527 g.r.t. and 8,475 d.w.t. compares unfavorably with worldwide (less Soviet) averages of 10,000 g.r.t. and 15,000 d.w.t. Nearly 72% of the commercial fleet's

³Excludes Caspian Sea fleet; river-sea ships subordinate to the Ministry of River Fleet, R.S.F.S.R.; and cargo ships and tankers subordinate to the Ministry of Fishing Industry formerly inventoried with the commercial fleet.

total deadweight tonnage is made up by 818 ships less than 10 years old; another 20% is comprised of 368 ships 10 to 20 years old, while 149 ships with 8% of the tonnage are 20 years or older. Nearly 630 of the ships can attain speeds of 14 knots or more, and approximately 5% of these can achieve 18 knots or more.

Over 80% of the ships have diesel propulsion, and less than 1% have gas turbine propulsion; the remainder have steam propulsion systems—99 coal-fired and 155 oil-fired. In view of the Soviet emphasis on acquiring ships of small tonnage, it is estimated that diesel systems will continue as the principal propulsion method.

The Ministry of Maritime Fleet, directly subordinate to the U.S.S.R. Council of Ministers, provides policy guidance, defines objectives, and directs all functions related to the maritime industry. The ministry's operating groups—marine steamship companies—in effect own and manage all maritime assets within their assigned geographical areas. In addition to normal carrier functions, each company is responsible in its area for operating repair yards, commercial port facilities, and intermediate training schools for seagoing personnel.

The U.S.S.R. has made great strides in modernizing its merchant fleet through a planned program for new construction and the retirement of overage tonnage. The Soviets had hoped to retire by 1971 all ships built prior to 1945. However, in mid-1970 the 132 ships in that category—including 45 U.S. lend-lease Liberty ships—were still active, and the majority of them will probably remain so in 1971.

The program for the retirement of obsolete ships, also ship sales, losses, and changes in subordination, accounted for the withdrawal of an estimated 680 ships totaling about 2,571,000 d.w.t. from the merchant fleet during the period 1 January 1960 to 1 July 1970. Of these ships, an estimated 206 with a deadweight tonnage of 1,034,169 were either scrapped or laid up. Another 27, totaling 110,249 d.w.t., were stricken from the registry of ships; 18 of these were sold and nine were sunk. An additional 447 ships—formerly carried as units of the oceangoing merchant fleet—were removed from that inventory and subordinated as follows: 277 ships (870,065 d.w.t.) to the Ministry of Fishing Industry, 94 river-sea ships (200,170 d.w.t.) to the R.S.F.S.R. Ministry of River Fleet, 38 ships (167,512 d.w.t.) to the Caspian Sea fleet, and 38 ships (189,092 d.w.t.) to the navy.

Had the Soviets maintained an increase of 1 million d.w.t. annually, the size of the merchant fleet would have exceeded 13 million d.w.t. by the end of 1970. However, as a result of yearly declines in the deadweight tonnage of acquisitions since 1966, and the relatively rapid pace of ship retirements, net gains have fallen short of plan goals. It is estimated that the fleet had approximately 1,395 ships totaling about 12 million d.w.t. by the end of 1970. If the current growth rate is maintained, by 1981 the fleet will comprise some 2,200 to 2,300 ships totaling 22 million to 23 million d.w.t. Since 1 January 1965 the merchant fleet has acquired no

FIGURE 40. MAJOR PORTS

NAME; LOCATION; ESTIMATED MILITARY PORT CAPACITY*	ACTIVITIES	HARBOR	BERTHS
BLACK SEA COAST AREA:			
Batumi 41°38'N., 41°38'E. 4,100	Primarily petroleum-shipping port. Other principal shipments: citrus fruits, vegetables, tea, timber, linseed oil, wire, and manganese ore; receipts are metals, machinery, grain, iron ore, and coal. Minor naval logistic support base. One minor shipyard with marine railways, accommodating craft 100 ft. long.	Breakwater-protected improved natural harbor; general depths up to 32 ft.	Alongside—5 ocean-type cargo vessels, 1 coaster, 2 lighters, 6 ocean-type tankers (1 at offshore pipeline) and 1 small naval vessel. Mooring—At least 8 for small naval vessels or coasters. Anchorage—9 ocean-type cargo vessels and numerous berths for small naval vessels and coasters. Alongside—7 ocean-type cargo vessels, 3 coasters, and 14 lighters. Anchorage—Limited number for ocean-type and coasters abreast South Naval Harbor; numerous ocean-type and coaster berths in roadstead abreast Commercial Harbor.
Feodosiya 45°02'N., 35°24'E. 10,400	Primarily petroleum-shipping port and naval port. Secondary naval operating and repair base and naval torpedo stations. Receipts consist of petroleum products, coal, and general cargoes; shipments consist mainly of military cargoes and petroleum products. Two minor shipyards and 1 boatyard with marine railways accommodating craft up to 100 ft. long. New-type floating petroleum-handling pier planned.	Three breakwater-protected artificial harbors and roadstead, central depths 18 to 30 ft.	Alongside—24 ocean-type cargo vessels, 1 coaster, and 40 lighters. Anchorage—Few ocean-type cargo vessels or light cruisers, and coasters or small naval vessels in Main Harbor; large numbers of all classes in unprotected roadstead outside harbor entrance.
Il'ichevsk 46°19'N., 30°40'E. 16,500	Considerable commercial importance; established as outpost of Odessa. Probably fastest-growing commercial port in U.S.S.R. Shipments are vegetable oils, molasses, machinery, vehicles, and coal; receipts are crude rubber, tea, jute, cork, coconut oil, and cotton. Major ship-repair yard; largest floating drydock with lifting capacity of 60,000 long tons. Expansion of shipyard and development of new port area in progress to serve whaling and fishing fleet.	Well-protected natural harbor with 2 main divisions; central depths 18 to 49 ft. in Main Harbor and 18 to 45 ft. in Inner Harbor.	Alongside—4 ocean-type cargo vessels, 4 coasters, 13 lighters, and 4 small naval vessels. Mooring—Reportedly vessels sometimes moor to pontoon wharves while awaiting berths.
Izmail 45°20'N., 28°50'E. 4,600	Important transshipment point for Danube river craft and ocean-going ships. Fishing center. Operating base for Soviet Danube river units of Black Sea Fleet. Receipts and shipments of bulk cargoes such as ores, metals, and coal. Other receipts are building materials, foodstuffs, tobacco, metal products, chemicals, and machinery. Other shipments are metal products, building materials, chemicals, grain, lumber, timber products, and foodstuffs. Two major shipyards; largest drydocking facility is floating drydock with lifting capacity of 1,500 tons.	Improved natural river harbor, central depths 26 to 104 ft.; controlling depth in 2 approach fairways are: 24 ft. over bar at Sulina via Bratul Sulina (middle delta arm of Danube); about 3 ft. over entrance bar via Kiliyskoye Girlo (N. delta arm).	Alongside—10 ocean-type cargo vessels, 9 coasters, 73 lighters, and 8 small naval vessels. Mooring—Naval quay provides Mediterranean-moorings for 39 small naval vessels. Anchorage—No standard berths in port area, berths limited to small craft; nearest anchorage for large ships 9 miles from port.
Kerch' 45°22'N., 36°29'E. 18,000	Controls approach to Sea of Azov and major inland-waterway system. Produces iron agglomerates for steel mills. Other principal activities: shipbuilding and fish processing. Shipments are iron agglomerates, iron ore, limestone, machinery and metal products, food products, fish, chemicals, and construction materials; receipts are fish, coal, and refined petroleum products. Primarily engaged in coastal trade and transshipment of cargo between Black Sea and Sea of Azov ports. Two major and 2 minor shipyards, largest drydocking facility is a floating drydock with lifting capacity of 5,000 tons. Small naval patrol-boat base. Reclamation project underway at S. end of Kamysch-Burun Shipyard where graving dock may be constructed.	Improved natural harbor, general depths 7 to 31 ft. in Kerchenskaya Bukhta, 13 to 19 ft. in Bukhta Kamysch-Burunskaya and Ferry Basin; controlling depth in approach channel 24 ft.; 4 channels lead to port facilities: controlling depth to main harbor 21 ft., to pier at Kolonka 15 ft., to Boatyard Basin 6 ft., and to Bukhta Kamysch-Burunskaya 18 ft.	

25X1

Kherson..... 46°38'N., 32°37'E. 6,600	Only maritime port on Dnepr. Significant shipbuilding and grain-shipping activity. Principal receipts are food products, cotton, metals, ores, crude oil and refined petroleum products, cement, and construction and shipyard materials; principal shipments are grain, timber, coal, iron and steel products, and sulphates. One major and 2 minor shipyards; controlled-level launching basin can be used as graving dock, with 600-ft. length on floor. Shipyard facilities being expanded.	Well-protected natural river harbor. Approach fairway controlling depth 23 ft.	Alongside—12 ocean-type cargo vessels, 26 coasters, 61 lighters, and 2 coaster-type tankers. Anchorage—Temporary anchorage for several coasters or small naval vessels.
Nikolayev..... 46°58'N., 32°00'E. 18,000	Shipbuilding center for commercial ships, and for naval ships of Black Sea Fleet. Principal receipts are general cargo, foodstuffs, refined petroleum products, and machinery; principal shipments are coal, iron ore, agricultural machinery, industrial equipment, and sheet metal. Minor naval operating base. Two major and 1 minor shipyards; largest floating drydock has lifting capacity of 8,000 tons.	Natural river port; controlling depth in approach channel, 27 ft.; general depths 18 to 34 ft. in Yuzhnyy Bug section; central depth 27 ft. in Ingul section.	Alongside—29 ocean-type cargo vessels, 19 coasters, 33 lighters, and 1 coaster-type tanker. Anchorage—Temporary anchorage area available for numerous coasters or small naval vessels, but anchorage prohibited by port regulation.
Novorossiysk..... 44°43'N., 37°47'E. 32,000	Important commercial port and one of principal cement-producing centers of U.S.S.R. Largest Soviet petroleum-exporting port. Other industries include a railroad-car repair shop, a sawmill, a machine-building plant, and a shipyard. Principal receipts are machinery, machine tools, rolled steel, steel pipes, and various ores; principal shipments are lumber, cement, crude oil and refined petroleum products, and grain. Small naval base provides operational support to small number of naval vessels based at port. One major and 4 minor shipyards; largest floating drydock has lifting capacity of 27,000 tons. Port improvement projects include the continued construction on Petroleum Harbor facilities and the completion of 3 moles.	Breakwater-protected improved natural harbor; central depths 47 to 50 ft. at Petroleum Harbor, 36 to 43 ft. elsewhere.	Alongside—43 ocean-type cargo vessels, 20 coasters, 27 lighters, 11 ocean-type tankers, 1 tank barge, and 5 small naval vessels. Anchorage—3 ocean-type cargo vessels or light cruisers in harbor; large number of all classes in bay outside harbor.
Ochakov..... 46°37'N., 31°33'E. 1,830	Naval security station, controlling and protecting access to significant part of major Soviet inland waterway system. Provides operational support to naval patrol craft and other light units of Black Sea Fleet. Naval training. Commercial activities are fish and food-product processing and canning, and brick manufacturing. Principal shipments are fish products, corn, salt, and canned goods. Principal receipts are coal and naval materiel.	Open roadstead and 3 artificial basins, general depth 7 to 19½ ft. Controlling depth at Naval Harbor is 17 ft., at Ochakovskaya Gavan' 16½ ft., and at Fishing Basin at least 7 ft.	Alongside—1 coaster, 6 lighters, and 13 small naval vessels. Anchorage—Numerous ocean-type or light cruisers in roadstead, and numerous coasters or small naval vessels inside entrance to Dneprovskiy Liman.
Odessa..... 46°29'N., 30°45'E. 37,000	Important commercial port and significant industrial center. Principal receipts are jute and jute products, grain, metals, tin, rubber, cotton, crude oil, refined petroleum products, and fruits; principal shipments are crude oil and refined petroleum products, grain, raw sugar, machinery, building materials, and textiles. Secondary naval operating base for destroyer escorts, submarines, minesweepers, and patrol craft. One major and 2 minor shipyards; largest floating drydock has lifting capacity of 15,000 long tons. Port developments include extension and reconstruction of 3 moles and large-scale harbor dredging program to increase depths.	Breakwater-protected harbor; general depths 8 to 42 ft. Controlling depths in entrance fairways at eastern entrance 32 ft., central entrance 40 ft., and western entrance 21 ft.	Alongside—34 ocean-type cargo vessels, 30 coasters, 25 lighters, 5 ocean-type tankers, 3 coaster-type tankers (1 at offshore pipeline), and 25 small naval vessels. Mooring—3 for small naval vessels. Anchorage—Extensive for all classes in roadstead outside harbor.

Footnote at end of table.

(Continued)

FIGURE 40. MAJOR PORTS

NAME; LOCATION; ESTIMATED MILITARY PORT CAPACITY*	ACTIVITIES	HARBOR	BERTHS
BLACK SEA COAST AREA (Continued):			
Poti..... 42°09'N., 41°40'E. 12,800	Important as a shipping point for manganese ore, and as site of a naval operating base for submarines and surface units. Principal receipts are coal, grain, sugar, rice, chemicals, machinery, and metallurgical equipment; principal shipments are manganese ore, chrome ore, cotton, and light industrial products. Naval base provides operational and logistic support for units of the Black Sea Fleet. Two minor shipyards; floating drydock has lifting capacity of 1,500 long tons. One of harbor basins being enlarged. Transshipping port for Danube oceangoing and river traffic. Principal products handled are iron ore, coal, petroleum, and general cargoes. Minor naval patrol-boat base with small marine railway facility for repairs to naval craft.	Breakwater-protected artificial harbor. Turning room is limited in all harbor divisions; central depths 18 to 36 ft.	Alongside—14 ocean-type cargo vessels, 5 coasters, 2 lighters, and 25 small naval vessels. Fixed mooring—33 Mediterranean-mooring berths for small naval vessels. Anchorage—Extensive anchorage in open roadstead.
Reni..... 45°26'N., 28°17'E. 4,300	Principal operating, repair, training, and supply base for Black Sea Fleet and Hq. of Commander of Black Sea Fleet; also has Office of the Commander of the Fleet, Chief of Staff, and other administration sections. Site of a naval academy. Two major and 3 minor naval shipyards; largest graving dock has length of 955 ft.	Improved natural river harbor, general depths 10 to 50 ft. Controlling depths in 3 approaches are: 24 ft. over bar via Brațul Sulina, 5 or 6 ft. over entrance bar via Brațul Sfintu Gheorghe, and only 3 ft. over entrance bar via Kiliyskoye Gârlo. Natural harbor with 3 divisions, all well protected except for group of small bays. At entrance to Balaklavskaya Bukhta length of vessels limited to about 400 ft.; other areas length not limiting. Central depths—Bukhta Severnaya 18 to 52 ft.; Balaklavskaya Bukhta 15 to over 100 ft.; other bays 10 to 72 ft.	Alongside—8 ocean-type cargo vessels, 1 coaster, 3 lighters, 1 tank barge, and 6 small naval vessels. Anchorage—No standard free-swinging berths, but undetermined number of ocean-type vessels can anchor in stream.
Sevastopol'/Balaklava..... 44°37'N., 33°32'E./ 44°30'N., 33°36'E. 29,000	Principal operating, repair, training, and supply base for Black Sea Fleet and Hq. of Commander of Black Sea Fleet; also has Office of the Commander of the Fleet, Chief of Staff, and other administration sections. Site of a naval academy. Two major and 3 minor naval shipyards; largest graving dock has length of 955 ft.	Improved natural river harbor, general depths 10 to 50 ft. Controlling depths in 3 approaches are: 24 ft. over bar via Brațul Sulina, 5 or 6 ft. over entrance bar via Brațul Sfintu Gheorghe, and only 3 ft. over entrance bar via Kiliyskoye Gârlo. Natural harbor with 3 divisions, all well protected except for group of small bays. At entrance to Balaklavskaya Bukhta length of vessels limited to about 400 ft.; other areas length not limiting. Central depths—Bukhta Severnaya 18 to 52 ft.; Balaklavskaya Bukhta 15 to over 100 ft.; other bays 10 to 72 ft.	Alongside—6 large, 13 medium, and 133 small naval vessels; 3 ocean-type cargo vessels, 1 coaster, 16 lighters, 2 coaster-type tankers, and 3 tank barges. Mooring—Double-buoy moorings for 9 large and 2 medium naval vessels. Anchorage—9 ocean-type cargo vessels or light cruisers, and 9 coasters or small naval vessels. Additional temporary anchorage in exposed roadstead.
Sochi..... 43°35'N., 39°43'E. 4,200	Port serving health and summer resort. Mostly passenger traffic and general cargoes handled. Small naval patrol-craft operating base. Minor shipyard with marine railways capable of hauling out only small craft for repairs.	Breakwater-protected artificial harbor, general depths 13 to 24 ft.	Alongside—3 ocean-type cargo vessels, 7 coasters, 6 lighters, and 1 small naval vessel. Mooring—14 ocean-type cargo vessels, 10 coasters, and 4 small naval vessels at Mediterranean-mooring berths. Anchorage—Several berths of all classes in roadstead W. of harbor.
Tuapse..... 44°05'N., 39°04'E. 10,200	Important as a shipping point for petroleum products, a naval petroleum supply depot, and a ship-repair center; also, as a resort town. Principal receipts are machinery, consumer goods, solid fuels, sugar, and grain; principal shipments are petroleum products, iron and steel products, iron and lead ores, timber, and machine tools. Two major shipyards; largest drydocking facility is a floating drydock with a lifting capacity of more than 10,000 long tons.	Breakwater-protected harbor, central depths 20 to 38 ft.	Alongside—10 ocean-type cargo vessels, 5 coasters, 11 lighters, 4 ocean-type and 1 coaster-type tankers, and 2 small naval vessels. Fixed mooring—15 ocean-type cargo vessels at Mediterranean-mooring berths. Anchorage—5 coasters or small naval vessels. Several berths of all classes in open roadstead SW. of port.

25X1

Yalta..... 44°30'N., 34°10'E. 3,900	Largest health resort in Crimea. Primarily a passenger port. Handles limited amounts of general cargoes, timber, coal, and dry-bulk construction materials. Minor boatyard effects drydocking repairs to craft small enough to be lifted onto wharf apron by crane. New commercial port facilities under construction NE. of harbor.	Breakwater-protected artificial harbor, general depths 10 to 40 ft.	Alongside—5 ocean-type cargo, 1 coaster, and 40 lighters. Mooring—Small vessels sometimes Mediterranean-moor to S. side of outer segment of small breakwater. Anchorage—None in harbor. Limited number of all classes short distance SE. of main breakwater. Alongside—22 ocean-type cargo vessels, 12 coasters, and 23 lighters. Anchorage—3 coasters or small naval vessels.
Zhdanov..... 47°04'N., 37°31'E. 16,900	Principal coal-shipping port on the Black Sea. Significant steel-producing center. Principal receipts are manganese ore, iron ore, and scrap iron; principal shipments are coal, and iron and steel products. One major and 1 minor shipyard; largest floating drydock has lifting capacity of 12,500 tons. Development of coal processing, sorting, and loading complex nearing completion.	Almost completely artificial port with 3 separate harbors. Central depths—Port Aovstali 16 to 24 ft., Port Zintseva Balka 12 to 26 ft., and Port Leytenanta Schmidta 7 to 9 ft. Controlling depths in fairways: W. channel 27 ft., middle channel 15 ft., and E. channel 18 ft.	Alongside—22 ocean-type cargo vessels, 12 coasters, and 23 lighters. Anchorage—3 coasters or small naval vessels.
BALTIC COAST AREA:			
Baltiysk..... 54°38'N., 19°54'E. 22,000	Principal naval operating base for the Baltic Fleet, also serves as an outpost for Kaliningrad. One major naval shipyard and 4 minor commercial shipyards; largest floating drydock has lifting capacity of 1,500 long tons.	Artificial harbor consisting of 8 divisions, most breakwater-protected; general depths 4 to 34 ft.; fairway leading to Basins No. I, II, and III of Naval Harbor has controlling depth of 30 ft.	Alongside—10 large, 21 medium, and 88 small naval vessels; 7 coasters and 12 lighters. Anchorage—Only small craft can anchor in harbor.
Kaliningrad..... 54°42'N., 20°29'E. 26,000	Significant commercial port and naval headquarters of Soviet Baltic Fleet. One of country's largest fishing ports and an important shipbuilding and repair center. Other principal industries are woodworking and the production of lumber, paper, cellulose, industrial alcohol, and railroad boxcars. Principal cargoes handled are fish and fish products, coal, logs, lumber, wood products, metals, ores, chemicals, fertilizers, grain, machinery, petroleum, cement, sugar, and general cargoes. Naval training and research facilities. Two major and 2 minor shipyards; largest floating drydock has lifting capacity of 10,000 tons. Port development projects underway include the construction of several additional shipbuilding ways, and an increase in cold-storage facilities.	Improved, natural river port consisting of inner and outer divisions; general depths of 7 to 28 ft.; fair protection afforded by low surrounding terrain.	Alongside—48 ocean-type cargo vessels, 26 coasters, 3 coaster-type tankers, 1 tank barge, and 12 lighters.
Klappeda..... 55°43'N., 21°07'E. 16,500	Transshipment point for imports from E. Germany and Scandinavian countries. Major crude-oil and coal-shipping terminal. Important shipbuilding and fishing industry center; also textile, electric battery, cellulose, paper, and fertilizer industries. Three major and 1 minor shipyards; largest drydocking facility a floating drydock with lifting capacity of 27,000 tons. Small naval patrol-craft support activity. Major ship-repair yard under development and partly operational. Petroleum pipeline connecting port with CEMA pipeline system is planned.	Breakwater-protected natural harbor consists of narrow part of lagoon, and short, lower reach of stream; general depths 10 to 32 ft.	Alongside—30 ocean-type cargo vessels, 52 coasters, 63 lighters, 3 ocean-type tankers, 2 tank barges, and 15 small naval vessels. Anchorage—Only for small vessels in harbor; unlimited number of all classes in unprotected roadstead outside harbor.

Footnote at end of table.

(Continued)

FIGURE 40. MAJOR PORTS

NAME; LOCATION; ESTIMATED MILITARY PORT CAPACITY*	ACTIVITIES	HARBOR	BERTHS
BALTIC COAST AREA (Continued):			
Kronshadt. 59°59'N., 29°46'E. 15,500	Important naval operating base and chief logistic-support base for Baltic Fleet; plays important part in guarding seaward approach to Leningrad; base has landing, ship-repair, ordnance, supply, communications, training, and miscellaneous medical facilities. One major naval shipyard; largest graving dock has length on floor of 1,160 ft.	Large, well-protected harbor consisting of 3 breakwater-enclosed basins, 2 smaller basins, and 3 canals; general depths 21 to 36 ft. Dredged approach has controlling depth of 32½ ft.	Alongside—4 large, 3 medium, and 99 small naval vessels. Fixed mooring—29 large, 39 medium, and 46 small naval vessels at Mediterranean-moorings, as alternative to 1 large, 1 medium, and 29 small vessels at alongside berths. Anchorage—Large number of coasters or small naval vessels.
Leningrad. 59°55'N., 30°15'E. 55,000	Important as the largest port in the Soviet Union, the center of the shipbuilding industry, the leading naval training center, and the Soviet Baltic area's most significant transportation and industrial center. Principal receipts are general cargo, coal, petroleum products, foodstuffs, sugar, cotton, metals, machinery, and chemicals; shipments are mainly lumber, fish, dry bulk chemicals, foodstuffs, and manufactured goods. Nine major and 5 minor shipyards; largest drydocking facility is a floating drydock with a lifting capacity of 6,000 long tons. Projects underway are the construction of several wharves and addition of handling and storage facilities. Plans include addition of container-handling facility, granary, very large storage building, and tunnel connecting Ostrov Kanonerskiy with mainland.	Partly artificial and partly natural, well-protected harbor at head of Gulf of Finland, consisting of 3 main divisions; general depths 7 to 33½ ft.	Alongside—89 ocean-type cargo vessels, 113 coasters, 201 lighters, 1 ocean-type and 1 coaster-type tankers, and 1 tank barge; alternative to 9 coasters and 1 lighter are 12 small naval vessel berths. Fixed mooring—1 ocean-type cargo vessel and several coasters; double-ended mooring berths for large naval vessels occasionally set in Neva. Anchorage—Large numbers of all classes in exposed Gulf of Finland.
Liyeypaya. 56°31'N., 21°01'E. 19,400	Important Soviet naval base, a military center with several army installations in the area, a strategic air-defense center, and commercial port. Naval base provides logistic support and repairs to submarines and surface vessels up to cruiser size. Receipts consist primarily of general military supplies, general cargoes, fish, sugar, coal, and refined petroleum products; shipments consist of grain, animal meal, butter, lumber, and oil cakes. One large naval shipyard; largest graving dock has length of 750 ft.	Mostly artificial, breakwater-protected harbor consisting of Outer Harbor, Commercial Harbor, and Naval Harbor; general depths 3 to 32 ft. Controlling depth through Naval Harbor Canal is 29 ft., and through Commercial Harbor is 24 ft.; passage through E. end of canal limited by 10-ft. underbridge clearances. Breakwater-protected artificial harbor, general depths 7 to 20 ft.	Alongside—29 ocean-type, 18 coasters, 4 lighters, 1 coaster-type tanker; and 1 large, 16 medium, and 49 small naval vessels. Anchorage—5 ocean-type cargo vessels or light cruisers, and 23 coasters or small naval vessels.
Lomonosov. 59°55'N., 29°46'E. 4,200	Port complements and serves as auxiliary supply depot for nearby naval base at Kronshadt. Handles naval supplies and limited amounts of lumber and dry-bulk cargoes. Minor shipyard has floating drydock with lifting capacity of 1,000 tons.	Breakwater-protected artificial harbor, general depths 7 to 20 ft.	Alongside—1 ocean-type cargo vessel, 8 coasters, 79 lighters, and 18 small naval vessels. Mooring—28 Mediterranean-mooring berths for small naval vessels, as alternative to 10 alongside berths for small naval vessels.
Pa'diski. 59°20'N., 24°06'E. 4,825	Small naval operating base supporting submarines and torpedo boats. Logistic supply base for military installations on nearby islands. Small fishing industry. Minor shipyard with drydocking repair capability limited to small naval vessels by lifting capacity of floating crane. New basin under construction for naval use.	Two breakwater-protected artificial basins, general depths 7 to 26 ft.	Alongside—1 large, 6 medium, and 16 small naval vessels. Anchorage—Large numbers of all classes in well-sheltered bay.

25X1

Riga..... 56°57'N., 24°06'E. 28,000	Largest commercial port of the Latvian S.S.R. Important industrial center engaged in shipbuilding and ship repairing; the manufacture and repair of railroad cars and locomotives; the production of electrical and radio equipment, paint and varnish, chemicals, superphosphate, and lumber and plywood. Principal receipts are ore, cotton, hides, cellulose, and coal; principal shipments are flax, hemp, tallow, turpentine, timber, dairy products, liquefied gas, and machinery. Naval operating and supply base provides logistic support for submarines and surface vessels up to frigate size. Three major and 4 minor shipyards; largest floating drydock has lifting capacity of 27,000 tons. Naval vessel repair facilities under construction. Fishing Harbor wharves being extended, and land reclamation is expanding fishing port area. Channel dredging increasing depths.	Large, improved river harbor with 3 segments—upper, middle, and lower harbors; protected by 2 jetties and inner breakwaters. General depths 12 to 39 ft. Controlling depths in the harbor fairways are 26 to 27 ft.	Alongside—46 ocean-type cargo vessels, 23 coasters, 1 ocean-type and 2 coaster-type tankers, 58 lighters; and 7 large, 5 medium, and 29 small naval vessels. Anchorage—Large numbers of all classes outside of harbor in unprotected roadstead; 8 coasters or small naval vessels in harbor.
Tallin..... 59°27'N., 24°45'E. 39,000	Important naval operating base of the Baltic Fleet, providing logistic support to naval vessels up to cruiser size. Capital of Estonian S.S.R., and administrative, industrial, and cultural center. Commercial activities consist of expanding ship-repairing, and fishing and whaling industries. Receipts are coal, timber, cotton, chemical fertilizers, sugar, coffee, and machinery; shipments are fish products, oils, meat, cement products, chemicals, light industry products, vehicles, and agricultural equipment. Three major and 4 minor shipyards; largest floating drydock has lifting capacity of 9,500 tons.	Well-protected, improved natural harbor; general depths 7 to 95 ft. Entrance channel for Admiralty Basin has controlling width of 60 ft.	Alongside—20 ocean-type cargo, 31 coasters, 24 lighters; 1 large, 12 medium, and 68 small naval vessels. Anchorage—Large numbers of all classes.
Ventspils..... 57°24'N., 21°34'E. 18,000	Most significant petroleum-shipping port in Baltic area. Other principal shipments are potash, timber, coal, and agricultural products. Principal receipts are fruits, frozen meat, vegetables, metals, sugar, cotton fibers, and agricultural machinery. Naval operational-support base for small fleet of submarines, minesweepers, and patrol craft. Minor shipyard with marine railway of 60-ton hauling capacity. Petroleum-exporting pier and fishing port facilities under development.	Breakwater-protected artificial Outer Harbor and natural stretch of stream; general depths 13 to 37 ft.	Alongside—21 ocean-type cargo vessels, 9 coasters, 3 lighters, 8 ocean-type tankers, 1 coaster-type tanker; and 1 medium and 31 small naval vessels. Anchorage—Numerous berths for all classes in roadstead; very limited and temporary berths within Outer Harbor.
Vyborg..... 60°43'N., 28°44'E. 6,500	Shipbuilding and production of paper, matches, and lumber. Small naval patrol-craft base with training component. Principal receipts are coal, coke, iron ore, steel plates, wheat, and petroleum products. Principal shipments are paper, matches, lumber, and chrome ore. Major shipyard with 450-ft.-long launching basin which can be used as repair basin. New facilities will reportedly be constructed to serve port as terminus of recently enlarged Saymskiy Canal.	Improved natural harbor, general depths of 6½ to 23 ft. Controlling depth in approach 20 ft.; controlling vessel length 400 ft.	Alongside—12 ocean-type cargo vessels, 7 coasters, 2 lighters, 1 coaster-type tanker, and 4 small naval vessels. Anchorage—Only for small craft in harbor.
PACIFIC COAST AREA:			
Kholmsk..... 47°03'N., 142°03'E. 5,800	Second most important port on Sakhalin. Principal fishing base on W. coast of Sakhalin. Principal shipments are paper and pulp products, fish products, and coal. Principal receipts are salt, timber, fruit, vegetables, cement, minerals, chemicals, other general cargoes, and military supplies. Small naval school. Minor shipyard has 335-ft.-long launching ways which can be used for repairs; hauling capacity 300 tons. Railroad-ferry terminal under construction for ferry service to Vanino on mainland.	Two breakwater-protected artificial basins and roadstead; general basin depths 9 to 33 ft., roadstead 32 to 110 ft. Controlling depth to N. harbor about 20 ft. and to main harbor 23 ft.	Alongside—4 ocean-type cargo vessels and 32 lighters. Anchorage—3 for large passenger ships or aircraft carriers, 2 for ocean-type cargo vessels or light cruisers, and 5 for coasters or small naval vessels.

Footnote at end of table.

FIGURE 40. MAJOR PORTS (Continued)

NAME; LOCATION; ESTIMATED MILITARY PORT CAPACITY*	ACTIVITIES	HARBOR	BERTHS
PACIFIC COAST AREA (Continued):			
Komsomol'sk..... 50°35'N., 137°02'E. 6,300	Principal shipbuilding port of Soviet Far East, and 4th largest industrial center; important as site of Trans-Siberian RR, crossing of Amur. Minor naval operating base. Principal industries are shipbuilding, petroleum refining, battery manufacturing, aircraft manufacturing and assembly, steel processing, sawmilling, and fish processing. Principal shipments are construction materials, canned fish, and lumber; principal receipts are coal, crude oil, fish, industrial materials, and consumer goods. Major shipyard has controlled-level launching basin with 750-ft. length and shipbuilding dock with 710-ft. length which can be used as repair facilities. Under construction are a second petroleum pipeline extending from Sakhalin, and a bridge over the Amur to replace the ferry.	Improved natural river harbor and improved basin; river depths up to 50 ft., basin depth max. 18 ft. Controlling depth in downriver approach most of season 17 ft.	Alongside—11 coasters, 42 lighters, and 1 coaster-type tanker. Anchorage—Extensive well-protected anchorage for all vessels able to reach port.
Korsakov..... 46°38'N., 142°46'E. 8,500	Leading port on Sakhalin serving as commercial and military port for the capital, Yuzhno-Sakhalinsk. Principal receipts are petroleum products, military supplies, industrial and mining equipment, automotive vehicles, and railroad rolling stock; shipments are mainly wood products, fish products, and coal. Coastal defense and patrol-craft operating base for Soviet Pacific Fleet. Three minor shipyards with marine railways capable of drydocking boats up to 60 tons.	Four breakwater-protected artificial basins and roadstead; general basin depths 6 to 28 ft., and in roadstead 20 to 100 ft.	Alongside—9 ocean-type cargo vessels, 1 coaster, 15 lighters, and 2 coaster-type tankers. Anchorage—Extensive for all classes in roadstead.
Lazarev..... 52°13'N., 141°32'E. 1,670	Important as log-shipping port and minor base for patrol boats of the Maritime Border Guard. Small fish-processing industry. Principal receipts are petroleum products and general cargo; only shipments are logs.	Breakwater-protected artificial harbor, general depths 14 to 24 ft. Controlling depth 23 ft. after periodic dredging; as little as 18 ft. in non-dredged years.	Alongside—3 ocean-type cargo vessels, 1 coaster, 7 lighters, and 1 coaster-type tanker. Anchorage—Extensive for coasters and small naval vessels.
Magadan..... 59°34'N., 150°48'E. 3,600	Supply and distribution center for significant mining region. Minor summer naval operating base. Principal shipments are fish, furs, and ores; principal receipts are petroleum products, construction materials, machinery and parts, explosives, foodstuffs, and coal. Minor shipyard; small craft hauled up on beach for repairs.	Well-protected natural harbor, general depths 23 to 120 ft.	Alongside—4 ocean-type cargo vessels, 3 coasters, 4 lighters, 1 ocean-type tanker, and 2 small naval vessels. Anchorage—Extensive for all classes.
Mago..... 53°15'N., 140°11'E. 3,250	Timber-exporting port, mostly in trade with Japan. Fishing industry. Winter harbor for Amur River craft. Receipts consist of salt, coal, petroleum products, and general cargo; shipments are timber and fish. Minor shipyard.	Natural river harbor; general depths of 10 to 16½ ft.	Alongside—19 coasters, 6 lighters, and 1 coaster-type tanker. Anchorage—Several berths for coasters or small naval vessels.
Moskal'vo..... 53°32'N., 142°31'E. 2,000	Primarily crude-oil shipping port. Distribution point for such receipts as foodstuffs and other supplies. Fish cannery.	Natural harbor, general depths 20 to 50 ft. Controlling depth in approach channel 22 to 23 ft.; under favorable conditions vessels with draft of 25 ft. can reach wharves.	Alongside—4 ocean-type cargo vessels and 1 coaster-type tanker. Anchorage—18 berths for ocean-type cargo vessels or light cruisers.

25X1

Nakhodka..... 42°48'N., 132°52'E. 36,000	Largest Soviet commercial port in Pacific. Principal receipts are construction materials, petroleum, fish, and grain; principal shipments are provisions, canned fish, clothing, machinery, military cargo, coal, lumber, and potassium salts. Two major commercial shipyards; largest floating drydock with lifting capacity of 25,000 tons; another with lifting capacity of 27,000 tons reportedly to be assigned to port. Naval activity provides limited logistic and operational support to patrol craft assigned to port; submarine training school for enlisted personnel. A large crude-oil shipping terminal with berthing facilities for large tankers is nearing completion; a specialized port area for exporting lumber and potassium is also under construction.	Natural harbor consisting of large bay with 4 smaller, well-protected adjoining bays. Bukhta Nakhodka, the main harbor, has general depths of 7 to 35 ft.; controlling depth in approach, 35 ft.	Alongside—39 ocean-type cargo vessels, 19 coasters, 49 lighters, 4 ocean-type and 1 coaster-type tankers, and 3 small naval vessels. Mooring—Some wharves sometimes used for Mediterranean-mooring. Anchorage—Large numbers of all classes.
Nevel'sk..... 46°40'N., 141°51'E. 7,700	Fishing port with fish-processing facilities. Principal shipments are fish, fish products, and coal; principal receipts are general cargoes, foodstuffs, and petroleum products. One major and 3 minor shipyards. Graving dock with length on floor of 300 ft. for drydocking repairs.	Improved natural harbor protected by reefs and breakwaters; general depths 5 to 24 ft.	Alongside—3 ocean-type cargo vessels and 63 lighters. Mooring—1 ocean-type tanker alternate Mediterranean-mooring berth. Anchorage—12 berths for large passenger ships or aircraft carriers.
Nikolayevsk..... 53°08'N., 140°43'E. 4,200	Important for strategic location at Amur mouth; controls river access to inland industrial areas. Minor naval base for Amur River patrols. Transshipment port for transfer of cargoes between shallow-draft river barges and deeper-draft coasters. Principal receipts are coal, petroleum products, timber, foodstuffs, and fish; principal shipments are sand, gravel, and provisions. Two major shipyards; largest drydocking facility is graving dock with length on floor of 320 ft.	Outer natural harbor and inner artificial basin; general depths 20 to 78 ft. in river stretch, and 10 to 20 ft. at inner harbor. Small adjoining Shipyard Basin has depth of at least 13 ft. Controlling depths in downriver approach are 20 ft. (MHHW) in N. fairway, and 11 ft. (MHHW) in S. fairway. Well-protected natural harbor; general depths 36 to 90 ft.	Alongside—5 ocean-type cargo vessels, 12 coasters, 41 lighters, 1 coaster-type tanker, and 3 small naval vessels. Anchorage—Numerous berths for coasters or small naval vessels.
Petropavlovsk-Kamchatskiy 53°01'N., 158°39'E. 21,400	Submarine and patrol-craft operating base. Hq. of Kamchatka Flotilla. Port of call for ships traversing the Northern Sea Route. Missile-tracking station and operating center for several missile-range instrumentation ships. Important ship-repair center with 3 major and 4 minor shipyards; largest floating drydock has lifting capacity of about 14,000 tons. Fishing and fish-processing industry.		Alongside—9 ocean-type cargo vessels, 8 coasters, 5 lighters, 10 coaster-type tankers; and 6 large, 27 medium, and 39 small naval vessels. Anchorage—Extensive for all classes.
Petrovka..... 43°07'N., 132°20'E. 7,200	Nuclear submarine naval support facility. Major naval shipyard for repair and fitting out; drydocking facility includes transverse-marine railways facility with 4,000-ton hauling capacity, capable of handling vessels 450 ft. long and 55 ft. wide.	Breakwater-protected improved natural harbor; central depth at least 28 ft.	Alongside—6 large, 8 medium, and 19 small naval vessels. Anchorage—A few berths in harbor for coasters or small naval vessels. About 35 berths for ocean-type cargo vessels or light cruisers, and numerous berths for coasters and small naval vessels in adjoining bays outside the harbor.

Footnote at end of table.

FIGURE 40. MAJOR PORTS
(Continued)

NAME; LOCATION; ESTIMATED MILITARY PORT CAPACITY*	ACTIVITIES	HARBOR	BERTHS
PACIFIC COAST AREA (Continued):			
Provideniya..... 64°26'N., 173°13'W. 1,500	One of main ports on Northern Sea Route. Minor summer operating base for submarines and small naval units. Principal receipts are coal, petroleum products, provisions, supplies, industrial and consumer goods, army materiel, and construction materials. Principal shipments are coal, furs, and supplies to arctic ports. Minor shipyard.	Well-protected natural harbor with central depths of 18 to 84 ft.	Alongside—3 ocean-type cargo vessels, 2 coasters, 1 ocean-type tanker at offshore pipeline berth, 1 coaster-type tanker, and 1 tank barge. Mooring—2 free-swinging mooring buoys, berth-type undetermined. Anchorage—1 large passenger ship or aircraft carrier, 5 ocean-type cargo vessels or light cruisers, and 25 coasters or small naval vessels in harbor. One additional large passenger ship or aircraft carrier berth at nearby Reyd Plover.
Sovetskaya Gavan'..... 49°02'N., 140°20'E. 18,000	One of most important naval bases in Far East. Site of significant commercial port, Vanino. E. terminal of branch line of Trans-Siberian RR. Principal receipts are grain, other foodstuffs, petroleum products, and coal. Principal shipments are timber, furs, canned fish, machinery, and construction materials. Three major shipyards. Largest drydocking facility has lifting capacity of 9,000 tons; another with lifting capacity of 27,000 tons reportedly to be assigned to port. Development projects underway are: a railroad ferry terminal to connect mainland with Sakhalin RR. at Kholmok; reconstruction of rail line to Komsomol'sk; and additional petroleum-bunkering facility.	Natural coastal harbor consisting of Bukhta Severnaya and 4 arms with general depths of 5 to 105 ft., and Bukhta Vanina with central depths of 18 to 50 ft.	Alongside—20 ocean-type cargo vessels, 6 coasters, 9 lighters, 4 coaster-type tankers; and 6 medium and 48 small naval vessels. Mooring—5 ocean-type cargo vessels, 1 ocean-type tanker, and 45 medium and 4 small naval-vessel Mediterranean-mooring berths. Anchorage—3 large passenger ships or aircraft carriers, 7 ocean-type cargo vessels or light cruisers, and 13 coasters or small naval vessels.
Vladivostok..... 43°05'N., 131°52'E. 27,000	Most important naval base and largest ship-repair center in the Far East; ranks 2d to Nakhodka as a commercial port. Hq. of Soviet Pacific Fleet. Principal receipts are fish and fish products, lumber, and petroleum; principal shipments are refined petroleum products, coal, grain, foodstuffs, lumber, and cement. Three naval and 2 commercial shipyards; largest drydocking facility is graving dock 700 ft. in length, and largest floating drydock has lifting capacity of 10,000 tons. Port development projects underway include expansion of fishing port, and development of S. side of inner half of Bukhta Zolotoy Rog.	Improved natural harbor consisting of 3 divisions: Bukhta Zolotoy Rog, Proliv Bosfor Vostochnyy, and Bukhta Novik. General depths 18 to 160 ft.	Alongside—31 ocean-type cargo vessels, 13 coasters, 10 lighters, 2 ocean-type tankers, 2 coaster-type tankers; 3 tank barges; 3 large, 10 medium, and 54 small naval vessels. Mooring—7 medium and 20 small naval vessels. Anchorage—6 large passenger ships or aircraft carriers, 15 ocean-type cargo vessels or light cruisers, and 20 coasters or small naval vessels.
Zaliv Strel'ok..... 42°52'N., 132°31'E. 5,800	Naval operating base for submarines and surface ships of Soviet Pacific Fleet. Naval supply and storage center for missiles, munitions, torpedoes, mines, and general stores. Major naval shipyard with floating drydock capable of lifting 8,000 long tons.	Natural harbor with central depths of 18 to 144 ft.	Alongside—2 medium and 65 small naval vessels. Mooring—2 large, 2 medium, and 20 small naval vessels at Mediterranean-mooring berths. Anchorage—Extensive for all classes.

25X1

ARCTIC COAST AREA:

Arkhangelsk..... 64°34'N., 40°32'E. 50,000	Largest sawmilling center and lumber port in U.S.S.R.; significant transshipping port for river and ocean traffic, and important supply and repair base for shipping on Northern Sea Route. Wood-processing, fish-processing, and canning industries also important. Principal shipments are lumber, wood products, furs, turpentine, furs, and supplies and equipment for polar stations; principal receipts are coal, salt, fish, hardware, machinery, tea, and coffee. Small naval operating base for light units of the Soviet Northern Fleet, particularly patrol craft and minesweepers; seaplane station. Three major and 3 minor commercial shipyards; largest drydocking facilities are floating drydock with lifting capacity of 5,000 tons, and 360- and 370-ft.-long graving docks.	Well-protected natural harbor consisting of part of river and sections of 4 channels. Ships entering limited by depth over bar of 24 ft. (28 ft. MHWN).	Alongside—107 ocean-type cargo vessels, 93 coasters, 107 lighters, 2 coaster-type tankers, 1 tank barge, and 6 small naval vessels. Anchorage—Numerous ocean-type cargo vessels or light cruisers, and numerous coasters or small naval vessels in roadstead; 19 ocean-type cargo vessels or light cruisers, and about same number coasters or small naval vessels in harbor.
Belomorsk..... 64°32'N., 34°46'E. 4,200	Serves lumber industry and fish cannery. Minor shipyard and boatyard have small floating drydock, lifting capacity about 500 tons. Transit stop for submarines and other naval vessels brought through waterway system on transporter docks.	Breakwater-protected artificial harbor, general depths 15 to 36 ft. Channels to curved pier and Timber Export Wharf have controlling depth of 15 1/2 ft.	Alongside—2 ocean-type cargo vessels, 6 coasters, 20 lighters, and 1 coaster-type tanker. Anchorage—Numerous berths for ocean-type cargo vessels or light cruisers, and for coasters or small naval vessels.
Dikson..... 73°30'N., 80°24'E. 1,000	Administrative and polar station. Important provisioning base for Northern Sea Route. Transshipping port for Yenisey river traffic and oceangoing traffic. Icebreaker depot. Fish-processing industry. Small naval patrol-craft operating base. Minor shipyard.	Natural river harbor, general depths 10 to 100 ft.	Alongside—1 ocean-type cargo vessel, 4 coasters, 1 lighter, 2 coaster-type tankers, and 3 small naval vessels. Anchorage—4 ocean-type cargo vessels or light cruisers, and 20 coasters or small naval vessels at Inner Road; large numbers of all classes at Outer Road.
Dudinka..... 69°24'N., 86°10'E. 4,400	Largest port in Soviet Arctic E. of Arkhangelsk. Serves Noril'sk, one of the most important mining centers in the Soviet Arctic. Principal receipts are logs, machinery, explosives, petroleum products, construction materials, and foodstuffs. Principal shipments are furs, coal, lumber, and copper, nickel, cobalt, platinum, and other ores. Port has fishing and timber-processing industries. Serves as transshipment point for transfer of cargoes between Yenisey river craft and oceangoing vessels.	Natural river harbor, general depths 7 to 125 ft.	Alongside—4 ocean-type cargo vessels, 33 lighters, and 1 tank barge. Anchorage—For numerous ocean-type cargo vessels or light cruisers on W. side of Yenisey.
Igarka..... 67°28'N., 86°35'E. 2,600	Primarily used for transshipping lumber between Yenisey river craft and oceangoing vessels. Minor boat repair yard with marine railways capable of hauling out only small river craft.	Natural river harbor in passage formed between right bank and offshore island, general depths 25 to 60 ft.; bars in downriver approach have controlling depth about 26 ft.	Alongside—5 ocean-type cargo vessels. Mooring—10 ocean-type Mediterranean mooring berths on W. side of Yenisey.
Iokanga..... 68°04'N., 39°41'E. 4,000	Submarine and torpedo-boat base. Naval anchorage and advance patrol and repairing base. Major naval shipyard has graving dock with overall length of 500 ft.	Natural harbor in passage formed between mainland and offshore islands, general depths 15 to 90 ft.	Alongside—8 medium and 6 small naval vessels. Anchorage—Large numbers for all classes of vessels.
Kandalaksha..... 67°08'N., 32°26'E. 2,100	Site of large aluminum plant; also produces chemical byproducts, aircraft parts, motor-vehicle and tractor parts, lumber supplies, and fish products. Principal receipts are foodstuffs, manufactured goods, coal, and other industrial products. Principal shipments are lumber, apatite, canned fish, iron castings, aluminum, and other metal products. No shipyards, but engineering works can effect limited floating repairs to ships.	Natural, well-sheltered harbor; general depths 26 to 225 ft. Controlling depth outside harbor entrance 31 ft.	Alongside—1 ocean-type cargo vessel and 2 coasters. Anchorage—10 ocean-type cargo vessels or light cruisers, and 7 coasters or small naval vessels.

Footnote at end of table.

FIGURE 40. MAJOR PORTS (Continued)

NAME; LOCATION; ESTIMATED MILITARY PORT CAPACITY*	ACTIVITIES	HARBOR	BERTHS
ARCTIC COAST AREA (Continued):			
Murmansk..... 68°58'N., 33°03'E. 31,500	Important as the largest fishing-fleet base in the U.S.S.R., western terminus of the Northern Sea Route, and principal supply depot and major ship-repair base of the Soviet Northern Fleet. Largest graving dock has length of 740 ft.; largest floating drydock has lifting capacity of 15,000 long tons. City is the administrative and commercial center of the Kola Peninsula. Principal shipments are apatite concentrate and raw apatite, flax, timber, fish and fish products; principal receipts are timber, raw sugar, cotton, steel products, coal, salt, wire, and building materials. Fishing and fish-processing port. Naval operating base provides logistic support for submarines and small surface vessels of Soviet Northern Fleet. Minor shipyard has marine railway for drydocking repairs to small craft.	Natural harbor, well-protected by inland location and surrounding mountainous terrain; general depths 6 to 198 ft.	Alongside—35 ocean-type cargo vessels, 24 coasters, 40 lighters, 2 coaster-type tankers, and 3 large, 1 medium, and 9 small naval vessels. Anchorage—5 large passenger ships or aircraft carriers, 4 ocean-type cargo vessels or light cruisers, and numerous coasters or small naval vessels.
Pechenga..... 69°41'N., 31°28'E. 2,600	Fishing and fish-processing port. Naval operating base provides logistic support for submarines and small surface vessels of Soviet Northern Fleet. Minor shipyard has marine railway for drydocking repairs to small craft.	Natural harbor at inlet off Barents Sea, general depths 15 to 340 ft.	Alongside—1 ocean-type cargo vessel, 5 coasters, 2 lighters, 1 ocean-type tanker, and 6 medium naval vessels. Mooring—3 mooring berths, type and size undetermined. Anchorage—1 large passenger ship or aircraft carrier, 3 ocean-type cargo vessels or light cruisers, and 2 coasters or small naval vessels.
Pevek..... 69°43'N., 170°18'E. 1,900	Northern Sea Route port. Also serves as ore-shipping port for large mining region. Principal receipts are machinery and equipment for the mines, lumber, logs, explosives, grain, and coal. Minor shipyard.	Natural harbor, protected by 2 islands and mainland, general depths 18 to 100 ft.	Alongside—4 ocean-type cargo vessels, 1 coaster, 1 lighter, and 1 ocean-type tanker at offshore pipeline berth. Mooring—Several Mediterranean-mooring berths for ocean-type cargo vessels on N. side of peninsula.
Polyarnyy..... 69°12'N., 33°28'E. 7,500	Important operating base for submarines and other light units of Soviet Northern Fleet, with facilities at Polyarnyy and nearby inlets. Hq. of Coastal Defense Forces. Commercial quarrying enterprise in area. Major naval shipyard has floating drydocks with lifting capacities of up to about 8,000 tons. Port controls entrance to Kol'skiy Zaliv and access to Murmansk and Severomorsk.	Natural harbor consisting of reach of Kol'skiy Zaliv and several adjoining bays; general depths of 18 to 360 ft.; entrance to Guba Pala limited by controlling depth of 32 ft. at MHWN.	Anchorage—Large numbers of all classes. Alongside—15 medium and 54 small naval vessels, 2 coasters, and 2 coaster-type tankers. Mooring—7 medium and 3 small naval vessels.
Rabochestrovsk..... 64°59'N., 34°48'E. 3,500	Significant lumber-shipping port. Serves town of Kem', about 5 miles distant. Principal industry is sawmilling. Other activities of area include brick manufacturing, asbestos mining, forestry, and hunting. Minor shipyard effects drydocking repairs to lighters and small craft lifted out by stiffleg derrick.	Natural harbor consisting of strait between 2 islands, general depths 18 to 42 ft. Controlling depth in approach channel is 23 ft. (28 ft. MHWN).	Anchorage—Great depths and limited swinging-room restrict anchorage; at least 4 berths for small naval vessels in Guba Tyuva. Alongside—6 ocean-type cargo vessels, 2 coasters, and 8 lighters. Anchorage—6 coasters or small naval vessels.

25X1

Severodvinsk..... 64°35'N., 39°47'E. 21,800	Most important naval shipbuilding yard in Soviet Arctic. Naval base and nuclear-submarine support facility. Principal industries are shipbuilding, lumbering, and manufacturing of munitions. One major and 1 minor shipyard; launching basin with length of 1,100 ft. can be used for drydocking repairs; floating drydock with lifting capacity of about 7,000 tons.	Natural river harbor, general depths 7 to 30 ft. (possibly deeper in places).	Alongside—4 ocean-type cargo vessels, 5 coasters, 17 lighters; and 7 large, 7 medium, and 79 small naval vessels. Mooring—Berths undetermined. Vessels occasionally moor along unimproved shoreline.
Severomorsk..... 69°05'N., 33°27'E. 11,000	Principal operating and logistic base for all units of Soviet Northern Fleet except submarines. Site of Naval Headquarters Northern Fleet, and Naval Headquarters, Submarine, Northern Fleet. Extensive missile and ordnance storage and handling facilities. Major shipyard has floating drydock with lifting capacity of 25,000 tons.	Natural harbor well protected by inland location and high surrounding terrain; general depths from large shoal area to 300 ft.	Anchorage—6 coasters or small naval vessels. Alongside—4 large, 9 medium, and 42 small naval vessels; 4 ocean-type tankers, and 1 coaster-type tanker. Mooring—18 Mediterranean-mooring berths for small naval vessels, as alternative to 4 small naval vessel alongside berths. 3 large naval vessels at free-swinging mooring berths.
Tiksi..... 71°38'N., 128°53'E. 1,000	Transshipment site for Lena river traffic and oceangoing traffic. Turnaround point for traffic coming from both ends of Northern Sea Route. Polar station. Fish canneries. Minor shipyard.	Natural harbor partly protected by peninsula and mainland, general depths 7 to 33 ft.	Alongside—2 ocean-type cargo vessels, 2 lighters, and 1 tank barge. Anchorage—Numerous berths for coasters or small naval vessels in harbor.

*The estimated military port capacity is the maximum amount of general cargo—expressed in long tons—that can be unloaded onto the wharves and cleared from the wharf aprons during a period of one 24-hour day (20 effective cargo-working hours). The estimate is based on the static cargo-transfer facilities of the port existing at the time the estimate is prepared and is designed for comparison rather than for operational purposes; it cannot be projected beyond a single day by straight multiplication.

25X1

FIGURE 41. SHIPS CONSTRUCTED FOR THE SOVIET MERCHANT FLEET, 1965-69
(Thousand tons)

YEAR BUILT BY	CARGO			TANKER			PASSENGER			TOTALS		
	No.	G.R.T.	D.W.T.	No.	G.R.T.	D.W.T.	No.	G.R.T.	D.W.T.	No.	G.R.T.	D.W.T.
1965:												
U.S.S.R	19	124.3	147.0	8	230.9	336.2	0	0	0	27	355.2	483.2
Communist countries	38	222.9	274.2	5	28.6	43.9	4	41.7	15.0	47	293.2	333.1
Non-Communist countries	21	154.7	178.6	16	191.2	270.4	0	0	0	37	345.9	449.0
Total	78	501.9	599.8	29	450.7	650.5	4	41.7	15.0	111	994.3	1,265.3
1966:												
U.S.S.R	35	168.5	214.4	12	207.3	296.5	0	0	0	47	375.8	510.9
Communist countries	43	260.0	327.1	9	135.2	185.4	3	21.9	6.2	55	417.1	518.7
Non-Communist countries	8	45.9	59.2	6	20.1	27.0	0	0	0	14	66.0	86.2
Total	86	474.4	600.7	27	362.6	508.9	3	21.9	6.2	116	858.9	1,115.8
1967:												
U.S.S.R	28	149.1	187.0	6	52.4	70.9	0	0	0	34	201.5	257.9
Communist countries	42	256.0	316.1	9	97.2	130.0	0	0	0	51	353.2	446.1
Non-Communist countries	25	97.2	120.5	8	26.8	36.4	0	0	0	33	124.0	156.9
Total	95	502.3	623.6	23	176.4	237.3	0	0	0	118	678.7	860.9
1968:												
U.S.S.R	20	111.9	140.8	8	97.8	135.6	0	0	0	28	209.7	276.4
Communist countries	43	306.0	395.0	4	44.6	62.7	1	19.9	6.0	48	370.5	463.7
Non-Communist countries	16	70.0	85.8	4	14.7	20.2	0	0	0	20	84.7	106.0
Total	79	487.9	621.6	16	157.1	218.5	1	19.9	6.0	96	664.9	846.1
1969:												
U.S.S.R	28	159.1	203.5	8	62.7	84.8	0	0	0	36	221.8	288.3
Communist countries	37	269.2	346.1	5	71.9	100.8	0	0	0	42	341.1	446.9
Non-Communist countries	12	48.6	60.0	5	18.4	25.2	0	0	0	17	67.0	85.2
Total	77	476.9	609.6	18	153.0	210.8	0	0	0	95	629.9	820.4

secondhand tonnage. Details of new ship construction during 1965-69 are given in Figure 41.

The Soviet merchant fleet is home-based in four geographic areas and organized into 14 companies—excluding the Baku-headquartered Caspian Marine Steamship Company—which engage in maritime shipping as follows:

BASE AREA	NUMBER OF COMPANIES	AREAS SERVED
Baltic Sea	4	Europe, Cuba, Canada, South America, Central America, west and east coasts of Africa, Australia, New Zealand, Middle East, and Mediterranean.
Black Sea	5	Europe, Cuba, Canada, South America, Central America, west and east coasts of Africa, Mediterranean, Middle East, Persian Gulf, Asia, Japan and Australia.
Far East	3	Soviet Far East, Japan, Australia, Indonesia, Cuba, Latin America, South America, Southeast Asia, and Canada (east and west coasts).
Arctic	2	Northern Europe, Canada, Mediterranean, and Soviet Far East (via Northern Sea Route).

The distribution of the fleet according to the four areas is given in Figure 42.

The volume of foreign seaborne trade has grown rapidly since 1960, and achievement of the planned 1970 goal would represent an increase exceeding 200% over the 10-year period. If the increase continues, by 1980 the volume will reach an estimated 308 million short tons, at least 75% of which is planned to be transported on Soviet ships. Because of the substantial rise in seaborne trade there has been no significant reduction in the chartering of foreign ships. The merchant shipping performance in foreign seaborne trade for selected years is as follows:

YEAR	SOVIET SHIP	FOREIGN SHIP	PERCENT OF TOTAL	
	CARRIAGE	CARRIAGE	SEABORNE TRADE BY:	
			Soviet	Foreign
	-- Millions of short tons --		ships	ships
1960	22.1	32.7	40.4	59.6
1965	50.1	51.0	49.6	50.4
1966	54.0	59.5	47.6	52.4
1967	53.5	65.8	44.9	55.1
1970*	106.9	79.3	57.4	42.6

*Plan goal.

In recent years the Soviets have extended their inland waterway operations into the maritime field, primarily through the development and increasing use of relatively large, dual-purpose, river-sea ships—both

FIGURE 42. MERCHANT FLEET STRENGTHS BY
BASE AREA*

TYPE	BALTIC SEA	BLACK SEA	FAR EAST	ARCTIC
Dry cargo:				
Number.....	234	300	305	170
G.R.T.	1,114,724	2,165,151	1,366,982	726,307
D.W.T.	1,489,202	2,753,714	1,772,521	911,836
Tanker:				
Number.....	41	155	52	1
G.R.T.	309,893	2,386,558	232,033	1,929
D.W.T.	434,522	3,456,981	312,892	2,014
Passenger:				
Number.....	8	29	22	5
G.R.T.	47,739	182,114	132,472	14,212
D.W.T.	16,098	62,707	66,193	5,180
Passenger-cargo:				
Number.....	1	2	8	2
G.R.T.	4,374	8,094	18,958	2,813
D.W.T.	3,112	5,444	19,110	2,286
Total:				
Number.....	284	486	387	178
G.R.T.	1,476,730	4,741,917	1,750,445	745,261
D.W.T.	1,942,934	6,278,846	2,170,716	921,316

*As of 1 July 1970.

U.S.S.R.- and foreign-built. The Greater Volga waterway system permits the completely internal passage of fully loaded 5,000-ton ships between the Baltic and Caspian Seas, and 2,700-ton ships between the Baltic, White, Black, and Caspian Seas, and enables river-sea ships to carry cargo from the European U.S.S.R. interior directly to seaports of other countries. Foreign seaborne trade by river-sea ship has developed in each of the four major sea basins of the U.S.S.R.—Baltic Sea, Black Sea, Arctic, and Far East—with most such activity originating in the Baltic and Black Sea basins. The river-sea ships supply only a small portion of the overall Soviet maritime cargo-carrying capacity; however, because of the frequency of voyages and short shipping routes, they do carry a substantial part of the seaborne trade to Scandinavia, Western Europe, and the Black and Mediterranean Sea areas. Since 1966 a small number of river-sea ships have been operating between Soviet Far East and Japanese ports.

The All-Union Association for Importing Ships—*V/O Sudoimport*, the state trading agency which does all the buying and selling for the shipbuilding and shipping industries, is making a determined effort to secure a share of the world ship market. In terms of trade, ships are considered by the Soviets as among the best earners of foreign exchange—mainly to pay for equipment and “technical know-how” imported from industrially advanced countries, many of which are in the hard-currency trading area. Prior to 1965 only nine Soviet-built ships were known to have been constructed for export. Since 1965 at least 30 merchant and fishing ships have been exported, the majority going to non-Communist countries. Continued exports to non-Communist and Communist countries could prove beneficial in the expansion of shipbuilding facilities and the acquisition of needed foreign exchange.

The opening of new and profitable trade opportunities, such as reestablishment of maritime relations^{25X1} the United States, would significantly affect future merchant marine development plans of the U.S.S.R. A relaxation of U.S. port security regulations, as well as elimination of threats of resistance by U.S. longshoremen, could give the Soviet merchant fleet access to the world's largest, most important segment of the open charter market.

The U.S.S.R. continues to emphasize improvements in the operating efficiency of the maritime fleet and ports, largely by the automation of ship cargo-handling and propulsion equipment and the modernization of port-handling facilities. Electronic equipment is also being introduced. The Soviets hoped to have the entire fleet computer-controlled by the end of 1970, with a resultant 5% to 6% increase in ship operation and cargo-handling efficiency.

The rapid expansion and development of the Soviet high-seas fishing fleet has even surpassed that of the merchant fleet. The fishing fleet has grown from a relative nonentity, operating in home waters following World War II, to the largest, most modern fleet of its kind in the world. As of 1 January 1970 the fleet comprised 4,150 fishing, whaling, and support and scientific research ships over 100 g.r.t.:

	SHIPS OVER 1,000 G.R.T.	SHIPS UNDER 1,000 G.R.T.
Number	954	3,196
G.R.T.	4,007,976	1,132,011
D.W.T.	2,731,794	628,600

While the primary mission of the fleet is fishing, its rapid development since 1960 is partly attributed to considerations of potential support for naval and other military operations. The high-seas fishing fleet has a limited capability to provide logistical support for military vessels. An unknown number of fishing ships are assigned intelligence collection duties but probably only as a secondary mission.

U.S.S.R. maritime policy can be expressed in terms of broad economic, political, and military objectives. The essential aim of maritime development has been to keep pace with the overall increase in foreign trade, thus providing the means to minimize expenditures for chartered shipping, and to earn foreign exchange by participating in the cross trades. While charter expenditures have declined in recent years, the earnings from cross trade activities have increased. The worldwide dispersal of the merchant and fishing fleets—and their increasing role in trade with developing non-Communist countries—strongly enhances the image and prestige of the U.S.S.R. The Soviets have used the fleets effectively to extend their influence and to neutralize or reduce non-Communist influence. The U.S.S.R. is in a position to exert a disruptive influence on world shipping by offering freight rates below established norms without regard to cost.

Militarily, the commercial merchant fleet has a significant capability for logistic support of amphibious,

sealift, and other naval operations. A direct connection probably exists between the military and the merchant marine, and, if required, the maritime fleets can rapidly be placed at the disposal of the armed forces. The majority of ships, as compared with the ones more recently built, have limitations in speed, age, size, or physical condition. Those particularly suitable for supporting a military operation totaled 432 as of 1 July 1970. All of these have 40- to 80-ton heavy-lift booms; 142 have one hatch measuring 52 to 79 feet in length; all have service speeds of 14 knots or greater, and all but six have been built since 1958.

H. Civil air

Civil aviation in the U.S.S.R. serves three basic purposes: support of the economy through domestic and international transport services; facilitation of administrative and political contact throughout the Soviet Union and other Communist areas; and advancement of the Soviet military effort, indirectly in support of industrial undertakings, and directly in terms of contributions to the military airlift potential. Priority among these functions is shifted in accordance with Soviet economic, political, and military objectives. In 1969 the nation's international and domestic trunk air route networks covered about 370,000 miles; approximately 68 million passengers and 1.7 million tons of cargo and mail were transported by air. The Soviets are attempting to place air travel on a competitive basis with other modes of transportation and to establish air transport as one of the primary means of passenger travel within the U.S.S.R. Air travel is advocated as the preferred system for distances in excess of 600 miles and is now the principal mode of passenger transport for trips exceeding 900 miles.

The Ministry of Civil Aviation (MGA) is responsible for all civil aviation activities in the Soviet Union. It is a component of the U.S.S.R. Council of Ministers, and its headquarters staff holds legislative, judicial, and administrative authority over all civil aviation matters. MGA conducts its operations within the framework of the prevailing national development plan. Its operating scope includes policymaking, regulation, and the responsibility for the provision and administration of airfields, air transport operations, and airwork.

MGA's flight operations complex (air transport and airwork) is known by the trade name Aeroflot. The various activities of Aeroflot are controlled by MGA through 30 Directorates of Civil Aviation. Twenty-six of the directorates are established within geographic and political boundaries throughout the U.S.S.R., and each is responsible for the actual conduct of air transport and general aviation operations originating in its territory. Each has an assigned aircraft fleet, operates airports, and provides air traffic control and other support services within its assigned area, governed by goals and standards established by MGA. The remaining four directorates are located at Moscow. One is responsible primarily for polar aviation activities, but also operates

scheduled and nonscheduled domestic and international cargo services. The other three, because of the volume of air activity in the Moscow region, divide a directorate's multiple duties among them. One is responsible for most international flights, another for long-haul domestic and major trunk route operations, and the third for special-purpose aviation (airwork) and local air route services.

The operation of Aeroflot is an intricate one, resulting in part from the tremendous scope and variety of activities that are combined in one organization. In addition to managing and conducting the air transportation system, including scheduled, nonscheduled, charter, and other special-purpose flights, Aeroflot flight operations include a wide variety of airwork. Its scheduled services are divided among three distinct types of air routes: international routes, domestic routes "of national importance" (trunk routes), and local routes (feeder lines).

Aeroflot's international air route network, estimated to cover approximately 90,000 route-miles, connects the Soviet Union with 65 foreign cities—14 in Communist nations and 51 in non-Communist countries. Most non-Communist country services originate in Moscow and link the Soviet capital with major cities in Europe, Asia, the Middle East, and north and central Africa, and with New York and Montreal. The carrier's scheduled services also extend to all of the Communist nations of the world except Albania. Within the European Communist area, Soviet air services connect with those of the other Warsaw Pact nations to form a closely integrated transport system.

Scheduled domestic services on Soviet trunk routes total about 2,500 flights daily during the peak summer operations period. Air route mileage is estimated at about 280,000 miles linking over 3,500 cities and towns. About 20% of the domestic flights originate in Moscow, connecting the capital with the major population and industrial areas of the country. Headquarters cities of the more important regional directorates are also hubs of domestic air traffic. In addition to domestic trunk route operations, each regional directorate conducts services on local routes within its area of responsibility. These local services consist of trunk route feeder flights, and flights to points not served by other means of transportation. The full extent of local service operations is not known, but it is estimated that the larger directorates operate as many as 400 scheduled services daily.

Several of the Aeroflot directorates are engaged in extensive helicopter passenger services. Many of these are believed to be in resort areas, such as the Crimea (Yalta, Simferopol') and the Caucasus (Sochi, Sukhumi), and a substantial number apparently are in remote areas where there are few airfields. There is a large commercial helicopter operation at Baku, where thousands of workers are flown annually between the city and offshore oil installations. In the Moscow area Aeroflot operates airport-to-downtown and interairport helicopter commuter services.

25X1

The Soviet carrier meets its international schedules with a fair degree of regularity. Domestic operations are somewhat less regular, flights often being delayed because of adverse weather conditions, lack of a full complement of passengers, or being held to meet some governmental demand. Another factor contributing to the wide fluctuation in Aeroflot's domestic operations is the number of so-called "special notice flights." Flights in this category presumably depend on the number of passengers requiring air transportation to a given point at a given time, and on the travel priority assigned by MGA. Many of these flights are utilized to augment scheduled operations and to account for variations in traffic demands.

In addition to air transport operations the regional directorates perform a variety of airwork services. These include: agricultural work (cropdusting, spraying, seeding, fertilizing); forestry patrol and firefighting; mosquito control; aerial spotting for the fishing and fur industries; iceberg reconnaissance; surveillance of navigational aids; supply and service to scientific expeditions; air ambulance and medical services; and air-sea and air-ground rescue operations. Airwork associated with the Soviet astronautics and atomic energy programs include atmospheric soundings, geodetic surveys, and aerial cartography. There also is evidence that widespread use is made of helicopters in activities such as pipeline and powerline surveillance, and as cranes.

MGA's multiengine transport (20 passengers or greater) inventory is estimated at 2,433 aircraft, including: 30 CLASSIC (Il-62) (Figure 43), 3 COCK (An-22), 40 CRUSTY (Tu-134), 30 CLEAT (Tu-114), 400 COOT (Il-18), 160 CAMEL (Tu-104/A/B), 70 CAT (An-10), 120 CUB (An-12), 80 COOKPOT (Tu-124), 500 COKE (An-24), 80 CODLING (Yak-40), 470 CRATE (Il-14), 5 COACH (Il-12), and 445 CAB (Il-2). Approximately 60 of these major transports are allocated for training and research purposes; about 150 are assigned to support the aircraft industry, and the remainder, plus an estimated 3,200 single-engine COLT (An-2) light transports, are assigned to Aeroflot's operating fleet. Utility, training, and liaison services are performed by approximately 800 CREEK (Yak-12), 170 Czechoslovak-manufactured Morava (L-200), and 100 MAX (Yak-18). In addition, Aeroflot operates about 900 HARE (Mi-1), HOPLITE (Mi-2), HOUND (Mi-4), HOOK (Mi-6), and HIP (Mi-8) helicopters. The larger jet and turboprop transports

(CLASSIC, CLEAT, COOT, and CAMEL) are used on long-haul international and domestic services, while the medium and light transports (CAT, COKE, COOKPOT, CRUSTY, CODLING, CRATE, CAB, and COLT) are primarily employed on the domestic trunk and local routes. CRUSTY and COKE are also utilized for short-haul international services. The COCK has not been assigned to scheduled services but has been used on nonscheduled international and domestic cargo operations. The CUB is used primarily for cargo transport and the COACH for utility and logistic supply services.

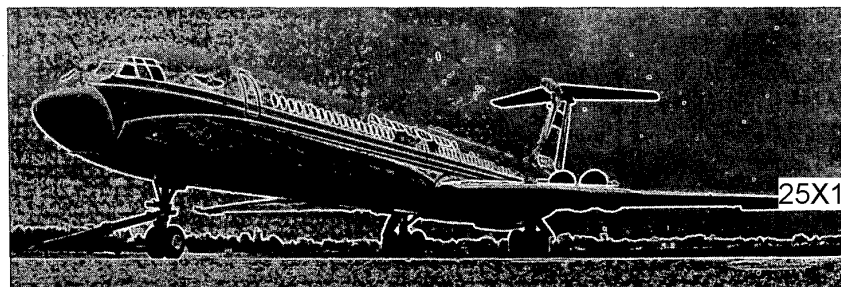
The civil air establishment includes its own maintenance and supply systems. General maintenance and repair are provided at line maintenance and repair workshops situated at one or more airfields within each regional directorate's area. Major overhaul and repairs are accomplished at several air repair bases, most of which are located at the principal aircraft factories throughout the country. In general, Aeroflot maintenance does not measure up to Western standards. However, the system is well organized and workable for the Soviet Union and results in a level of aircraft availability fully sufficient to meet Aeroflot schedules.

All aircraft in the civil fleet, with the exception of approximately 2,800 Polish-produced COLTs and a small number of Czechoslovak light aircraft, are manufactured in the U.S.S.R. The Soviet Union produces and supplies almost all aircraft spare parts, components and related equipment, as well as aviation fuels and lubricants. Stocks are sufficient to support current civil air operations, and no deficiencies are known to exist in any of these areas.

The number of Ministry of Civil Aviation employees is estimated to be between 200,000 and 300,000, including a maximum estimated pilot strength of 32,000. The principal sources of Aeroflot personnel are the aeroclubs (the aviation arm of the Soviet youth organization DOSAAF—Voluntary Society for Cooperation with the Army, Aviation, and the Fleet), which provide elementary aviation training in the interests of both civil and military aviation. Although most new Aeroflot employees have had only aeroclub training, some also have had military aviation training.

The Ministry of Civil Aviation conducts its own training system. Three-year courses are offered for flight personnel and ground technicians at several ministry schools. Pilot graduates are usually first assigned to

FIGURE 43. Aeroflot CLASSIC (Il-62). This newest and largest jet is used mainly on the international prestige service



Aeroflot units equipped with light aircraft, then progress to advanced flight training schools. After job assignment, pilots and other technical flight personnel receive conversion and on-the-job flight training. The effectiveness of the training system and the proficiency of Aeroflot's crews cannot be accurately assessed. The magnitude and success of the domestic operations attest to a satisfactory degree of competence, but no statistics on the numbers and causes of aircraft accidents have been released by the government. Crews observed on international flights, probably selected from the best available personnel, are technically well trained and efficient. However, strict adherence to flight safety procedures is low by Western standards, particularly in areas of dense air traffic.

Mobilization of Aeroflot personnel and equipment for military purposes would entail relatively minor technical and administrative adjustments. Aeroflot is a government-owned entity under authority of the U.S.S.R. Council of Ministers and may be used in any manner the council deems is in the best interests of the state. The carrier's military potential is enhanced by the fact that many of the different types of Soviet-manufactured transport aircraft are in common use by both military and civil aviation. In addition, a substantial number of Aeroflot flight personnel are reservists in the air forces, and all personnel are believed to hold mobilization assignments. The Minister of Civil Aviation and several of his deputies are military officers. Personnel and equipment of civil airfields, air traffic control centers, and aircraft maintenance and overhaul bases are readily available and provide equipped installations for rapid conversion to military use.

On 15 October 1970 the Soviet Union submitted formal notification of adherence to the 1944 Chicago Convention on International Civil Aviation, a prerequisite to membership in the International Civil Aviation Organization (ICAO). In accordance with the ICAO charter, actual membership by the U.S.S.R. became effective 30 days later on 14 November 1970. ICAO is a specialized agency of the United Nations and the principal multilateral aviation organization concerned with the orderly development of international air transport services. The U.S.S.R. is also signatory to the Convention for the Unification of Certain Rules Relating to International Carriage by Air (Warsaw Convention, 1929) and to the 1955 Hague Protocol to the Warsaw Convention. In general terms, the Warsaw Convention and its protocol refer to the liability of an air carrier in case of injury to passengers or damage to baggage and cargo on international flights. Aeroflot is not a member of the International Air Transport Association (IATA), a rate-fixing and coordinating association of scheduled international air carriers. However, the U.S.S.R. sends observers to IATA conferences, and the Soviet Government continues to show interest in active membership.

The Soviet Government has entered into bilateral civil aviation agreements and arrangements with 65 nations. These include the 13 Communist countries and 52 non-Communist countries—12 in Europe, 9 in the Middle East, 18 in Africa, 11 in the Far East and Asia, and the United States and Canada. Under the terms of these agreements and arrangements Aeroflot operates its international services, and in turn is served by 27 foreign carriers. Seven European Communist air carriers, Balkan (Bulgaria), CSA (Czechoslovakia), Interflug (East Germany), JAT (Yugoslavia), LOT (Poland), MALEV (Hungary), and TAROM (Romania), conduct flights between their respective countries and cities in the European U.S.S.R. Two Asian Communist carriers, CAAC (Communist China) and Air Mongol (Mongolia), operate services to the U.S.S.R. from Peking and Ulaanbaatar, respectively, but only as far as Irkutsk in south-central Siberia. Eighteen non-Communist carriers—Air Algerie, Air Canada, Air France, Air-India, Alitalia, Ariana Afghan Airlines, Austrian Airlines, British European Airways, British Overseas Airways Corporation (BOAC), Finnair, Iran National Airlines, Japan Air Lines, KLM-Royal Dutch Airlines, Pakistan International Airlines, Pan American Airways, Scandinavian Airlines System, Swissair, and United Arab Airlines—operate to the U.S.S.R. on services largely limited to a capital-to-capital basis. Air France, Finnair, and the Scandinavian Airlines System (SAS) serve Leningrad in addition to Moscow. SAS also operates a "Trans-Asian Express" service across European and south-central U.S.S.R. via Tashkent to points in south and southeast Asia. Iran National Airlines, Pakistan International Airlines, and Air-India services extend from their respective countries via Moscow to London. Ariana Afghan Airlines services are limited to Tashkent. Three carriers, Japan Air Lines, Air France, and BOAC, have been authorized to conduct operations between Europe and Japan via Moscow along the recently opened trans-Siberian route.

I. Airfields⁴

The air facilities system of the Soviet Union consists of more than 3,100 airfields and some 15 seaplane stations. About 300 airfields are in regular use by military aircraft. Information on the number used by civil aviation is unavailable; however, the large amount of transport and nontransport operations conducted by Aeroflot and the flight training and sports flying activities of DOSAAF would account for the majority of Soviet airfields. Many Aeroflot airfields are shared jointly with the air forces. Some airfields are believed to be closed, abandoned, or used infrequently by either military or civil aircraft, but these are considered usable or easily restorable. A substantial number are military reserve bases, many of which are used occasionally

⁴Details on individual airfields are available in *Airfields and Seaplane Stations of the World*, Volumes 33 through 39, published by the Defense Intelligence Agency.

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during deployment training exercises. Because all Soviet airfields are government owned, conversion to either military or civil use is easily accomplished. Only about six of the 15 seaplane stations are militarily significant and used as naval flying boat bases. The others, some of which may no longer be operational, are believed to be used by float-equipped light civil aircraft.

Except in areas where permafrost, tundra, mountainous terrain, or problems of logistic support are limiting factors, the Soviet Union has an adequate, well-distributed air facilities system capable of supporting all types of air operations. The existing system could easily be expanded by the improvement of undeveloped airfields or by the construction of new installations. In addition, there are many hundreds of sites where airfields existed during World War II, particularly in the former combat zones of the European U.S.S.R. Most of them were sod fields, since returned to cultivation, but a large percentage of these sites would be suitable for construction of modern airfields.

The distribution pattern of Soviet airfields generally follows the population and surface transport patterns. Density is greatest in the European U.S.S.R., with important complexes or concentrations around Moscow, Leningrad, Arhangel'sk, the Kola Peninsula, Gor'kiy, Kuybyshev, Saratov, Kiyev, Khar'kov, along the Polish and Czechoslovak borders, in the Crimea, and elsewhere along the Black Sea coast. The Trans-Caucasus region, which extends into Asia Minor, has important complexes from Krasnodar to Baku, including the areas of Stravropol', Groznyy, Tbilisi, and Kutaisi.

In Soviet Central Asia, air facilities are located mainly along the Trans-Siberian and other railroad systems of the area. There is a small concentration of airfields among the industrial cities just east of the Urals and a relatively heavy concentration in the border areas of southern Kazakhstan. Near the central Siberian cities of Omsk, Novosibirsk, Irkutsk, and Chita there are significant airfield complexes. Elsewhere in central Siberia air facilities are widely scattered and are generally minor installations whose principal function is to support regional air transportation. There are large areas of desert in Kazakhstan and Soviet Central Asia where the lack of water and transportation has retarded or even precluded airfield development. Vast expanses of marshland have had the same effect in western Siberia.

Most of the air facilities in the Soviet Far East are located in the southern half of that area. The southern maritime region has one of the heaviest and most important airfield concentrations in the U.S.S.R. Other concentrations and complexes are located near Belogorsk, Khabarovsk, Komsomol'sk, Sovetskaya Gavan', and in central and southern Sakhalin. There is a chain of airfields in the Kuril Islands, but most of them are minor installations. Airfields in northeastern Siberia are generally widely dispersed except for the small but important complexes at Magadan, Petropavlovsk-Kamchatskiy, Anadyr', and Provideniya.

In the Soviet Arctic, airfields are distributed in a thin but fairly regular pattern along the coast, on the offshore islands, and along the principal rivers flowing into the Arctic Ocean. There is a major concentration on and near Kola Peninsula and a lesser one on Chukotsk Peninsula. Isolated, minor airfields are thinly scattered throughout the Soviet Arctic hinterland to provide settlements with air communications to the more important urban centers. Airfield distribution in much of the Soviet Arctic is inadequate for optimum deployment of air defense fighters. Although additional major airfields could be built in the area, most of the region is dependent on the Northern Sea Route and the northward flowing river systems for logistic support. Without a more adequate supply system, additional airfields would be of limited value.

Soviet military airfields used for basing units of regimental or larger size generally have a permanent-surface runway and taxiway system, on-field POL storage, extensive housing, and other support facilities, and they are served by railroads or other adequate means of logistic access. Special weapons storage and handling facilities are located at or near most of the more important bases. Hangars, however, are usually found only at airfields having a depot maintenance function. Major civil airfields are similar except for the absence of extensive housing, ordnance storage, and other features required only by military users. In place of these, civil airfields generally have the terminal and cargo handling facilities needed for civil air operations.

Heavy and medium bomber home bases usually have a concrete runway 8,200 to 13,100 feet in length. Jet light bomber and jet fighter bases generally have runways of concrete or asphalt in the 6,600- to 8,200-foot range. A few military transport bases have shorter runways. Concrete is the predominant surfacing material at major airfields, although asphalt is also used, especially for resurfacing old concrete runways. Although multiple intersecting runways were prevalent at major airfields built during and before World War II, postwar development has featured the single-runway layout.

Most Soviet fighter and bomber bases have an auxiliary graded earth or sod runway or landing area. These are usually situated parallel to the main, permanent-surface runway and are often of greater length. Soviet air units continue to operate several types of jet fighters, bombers, and transports from runways having graded earth, steel mat, sod, or other temporary surfaces. For training and during redeployment exercises, generally in the summer months, jet fighter units often use undeveloped airfields having only a temporary runway surface. Many of these landing grounds and temporary runways are of considerable size and would be suitable for recovery or redeployment operations in the event of war. When tactical units use natural-surface landing grounds, a runway area is usually marked out and used until the surface deteriorates. A new area is then marked out and used while the former is being restored.

Taxiways and parking facilities are generally built of the same material as the runway. All major military airfields and most of the larger civil airfields have a loop or parallel taxiway system. Some civil airfields which do not have enough traffic density to warrant a loop or parallel system have only a link taxiway from one end or from the center of the runway to the parking area. Parking facilities consist of either hardstands or aprons; most military airfields have both. In many instances disused secondary runways have been converted to parking aprons. Where adequate hard-surface parking facilities are not available, general field parking is used extensively.

Soviet navigational aids have improved steadily since World War II but are not yet as sophisticated as those of the United States and other Western nations. Nearly all major airfields have a radar ground-controlled approach (GCA) system and an instrument landing system. There are two types of Soviet instrument landing systems. The older is the beacon approach system, consisting of a pair of nondirectional radio beacons aligned with the runway and located in its approach zone. Marker beacons are usually colocated with both the outer and inner nondirectional beacons. The newer system is a localizer, glide path, and marker beacon arrangement, similar but not identical to the U.S. instrument landing system. Distance measuring equipment is often incorporated with the newer system to provide a more adequate means of navigation and approach. Various types of air surveillance radar are generally available, in addition to GCA. Older types of navigation equipment, such as direction finders and nondirectional radiohoming beacons, are located at nearly all operational airfields and are still the principal point-to-point navigational aids. Control towers are in general use and are occasionally supplemented by mobile control vehicles positioned near the downwind end of the runway.

Runway and approach lights of various types are generally available at major Soviet airfields. Other standard lighting facilities, including boundary, obstruction, identification, and floodlights, are also available. Minor airfields have at least floodlights and, usually, obstruction and boundary lights. Portable runway flares are also used.

Most of the major maintenance and overhaul of aircraft in the Soviet Union are accomplished by centralized maintenance depots, each of which serves many operational bases. Aircraft factories are also used for this purpose. This practice reduces the need for extensive maintenance facilities, with their associated hangars and large shops, at most operational airfields. Consequently, although numerous small shops are normally present, hangars are seldom seen except at the central maintenance bases. Mobile maintenance units, temporary canvas shelters, and mobile heating units are used in performing field maintenance on a year-round basis.

From 3 million to 12 million or more gallons of on-base fuel-storage capacity is believed to be available at

medium and heavy bomber bases and the more important civil airfields. Fighter and light bomber bases usually have from 1 million to 3 million gallons of storage capacity. Airfields basing smaller units and those not regularly used by jet aircraft have substantially lower capacities. Fuel is usually stored in cylindrical underground, semiburied, or aboveground tanks, grouped in one or more POL areas near the flight line and served by a railroad spur. Large off-base fuel-storage depots are sometimes located within a few miles of major airfields or airfield complexes. Where fuel requirements are not great and good access to fuel depots is available, some airfields are supplied directly from tank cars. Portable fuel-storage facilities are often used at lesser airfields, especially those in seasonal use for redeployment exercises. These generally consist of horizontal cylindrical tanks that are frequently deposited at random in the servicing area and may be removed when units return to their home bases. Refueling trucks are the predominant means of refueling aircraft, although some airfields are believed to have a more modern system for rapid, simultaneous refueling of aircraft.

Adequate housing and messing facilities are available at most operational airfields. On-base housing at the better developed airfields usually consists of numerous masonry barracks and often includes quarters for dependents. Local civilian housing is frequently used to supplement on-base housing. Tents are used at undeveloped airfields where no other housing exists, particularly during deployment exercises.

Ammunition and high-explosive storage facilities are believed to be available at all airfields intended for use by combat aircraft. Storage, assembly, and loading facilities for special weapons, including nuclear weapons and air-to-surface and air-to-air missiles, are available in accordance with the mission of the units based on the airfields. Other supplies and equipment are stored in conventional warehouses at the major airfields.

All military home bases and the major civil airfields are capable of supporting sustained operations of military aircraft. Nearly all home bases could be further expanded if necessary. A large proportion of the airfield construction work undertaken since 1960 has consisted of runway extension to accommodate newer or larger types of combat aircraft. Activity of this type is believed to be continuing.

Information on projected military construction is not available. In the light of declining numbers of military aircraft it would appear that the Soviets have a surplus of military airfields; however, a few new major military airfields have been built in recent years, and some are believed to be still under construction. These new permanent facilities are probably needed to supply airfields in areas considered to be deficient, notably along the Sino-Soviet border. A substantial number of temporary-surface airfields, of the type the U.S.S.R. has traditionally used for reserve, redeployment, training, and recovery purposes, have been built in recent years. It is believed this trend will continue. Such airfields,

while not suitable for intensive use over an extended time period nor on an all-weather basis, would be useful as back-up or dispersal facilities in the event of hostilities.

Since 1967-68 a large-scale program to develop passive defenses at military airfields has been in progress. This program has provided dispersed and revetted hardstands at heavy and medium bomber bases and the extensive construction of hardened aircraft shelters at fighter bases. These shelters,

commonly called hangarettes, are above-ground bunkers designed to completely enclose one or two aircraft in an ordnance-resistant structure. Two types have emerged. One is constructed of concrete arches bolted together, the other of concrete slabs fastened to an I-beam frame. Both types are placed on concrete slabs and footings and are mounded over with sod-covered earth.

Selected major airfields are listed in Figure 44. Other important airfields are listed in Figure 45.

FIGURE 44. SELECTED MAJOR AIRFIELDS*

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NAME AND LOCATION	LONGEST RUNWAY: SURFACE; DIMENSIONS; ELEVATION ABOVE SEA LEVEL		RUNWAY LOAD CAPACITY (LARGEST AIRCRAFT SUPPORTABLE)	REMARKS**
	<i>Feet</i>			
Akhtyubinsk/Vladimirovka 43°18'N., 46°14'E.	Concrete 13,100 x 250 30	<i>est</i> BEAR	Joint. POL capacity: <i>na</i> . Major development and test facility; also SAF (Soviet Air Forces) fighter base.	
Alekseyevka 49°14'N., 140°11'E.	Concrete 8,200 x 260 570	BADGER	Military. POL capacity: 2,000,000 gal. Naval medium bomber base.	
Anadyr'/Leninka 64°44'N., 177°45'E.	Concrete 11,500 x 260 150	BEAR	Military. POL capacity: 15,000,000 gal. SAF medium bomber, fighter, and staging base.	
Anisovo Gorodishche 54°13'N., 34°22'E.	Concrete 8,200 x 270 700	BADGER	Military. POL capacity: <i>na</i> . SAF medium bomber base.	
Arkhangel'sk/Kholm 64°23'N., 40°44'E.	Concrete 8,900 x 200 70	<i>do</i>	Military. POL capacity: 2,200,000 gal. Naval medium bomber base.	
Artem North 43°24'N., 132°10'E.	Concrete 8,200 x 200 43	<i>do</i>	Joint. POL capacity: <i>na</i> . Naval medium bomber base and civil jet transport facility for Vladivostok.	
Baranovichi 53°06'N., 26°03'E.	Concrete 9,800 x 300 600	BLINDER	Military. POL capacity: <i>na</i> . SAF medium bomber and fighter base.	
Belaya 52°55'N., 103°34'E.	Concrete 9,800 x 260 1,475	BADGER	Military. POL capacity: <i>na</i> . SAF medium bomber and fighter base. Used occasionally by civil aircraft as alternate for Irkutsk.	
Belaya Tserkov' 49°48'N., 30°01'E.	Concrete 8,200 x 260 570	<i>do</i>	Military. POL capacity: 3,000,000 gal. SAF medium bomber base.	
Bobruysk 53°06'N., 29°13'E.	Concrete 8,200 x 260 470	<i>do</i>	<i>Do</i> .	
Bykhov 53°31'N., 30°12'E.	Concrete 8,200 x 260 530	<i>do</i>	Military. POL capacity: <i>na</i> . Naval medium bomber base.	
Chervono Glinskoye 45°57'N., 29°23'E.	Concrete 8,200 x 260 310	<i>do</i>	Military. POL capacity: <i>na</i> . SAF medium bomber and jet fighter base.	
Dolon' 50°32'N., 79°10'E.	Concrete 13,200 x 260 680	BEAR	Military. POL capacity: <i>na</i> . SAF heavy bomber base.	
Engel's 51°29'N., 46°13'E.	Concrete 11,500 x 300 110	BISON	Military. POL capacity: 3,000,000 gal. SAF heavy bomber base.	
Gomel'/Pribytki 52°18'N., 31°10'E.	Concrete 9,800 x 260 490	BLINDER	Military. POL capacity: 6,700,000 gal. SAF medium bomber base.	
Gvardeyskoye 45°07'N., 33°58'E.	Concrete 8,200 x 260 470	BADGER	Military. POL capacity: <i>na</i> . Naval medium bomber base.	

Footnotes at end of table.

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FIGURE 44. SELECTED MAJOR AIRFIELDS

(Continued)

NAME AND LOCATION	LONGEST RUNWAY: SURFACE; DIMENSIONS; ELEVATION ABOVE SEA LEVEL	RUNWAY LOAD CAPACITY (LARGEST AIRCRAFT SUPPORTABLE)	REMARKS**
	<i>Feet</i>		
Irkutsk Southeast. 52°16'N., 104°24'E.	Concrete..... 9,000 x 220 1,660	CLEAT.....	Joint. POL capacity: <i>na</i> . Major Aeroflot base; also believed to be SAF maintenance facility.
Kalinin..... 56°50'N., 35°45'E.	Concrete..... 8,200 x 260 460	BADGER.....	Military. POL capacity: 5,400,000 gal. SAF medium bomber base.
Kaliningrad/Proveron. 54°46'N., 20°24'E.	Concrete..... 10,000 x 200 115	BLINDER.....	Military. POL capacity: <i>na</i> . Naval medium bomber base.
Kazan' North..... 55°52'N., 49°08'E.	Concrete..... 10,200 x 300 215	.....do.....	Joint. POL capacity: <i>na</i> . SAF and Soviet aircraft industry. Test and flyway facility for aircraft plant.
Khabarovsk Northeast..... 48°31'N., 135°11'E.	Concrete..... 11,500 x 300 230	CLEAT.....	Civil. POL capacity: 6,000,000 gal. Main civil airfield for Khabarovsk, center of civil air transportation in the Soviet Far East.
Khorol' East..... 44°27'N., 132°08'E.	Concrete..... 12,200 x 300 350	BEAR.....	Military. POL capacity: 1,200,000 gal. SAF and naval medium bomber base.
Kiev/Borispol'..... 50°21'N., 30°54'E.	Concrete..... 8,200 x 260 410	BADGER.....	Joint. POL capacity: <i>na</i> . SAF fighter base and civil jet transport facility for Kiev.
Kipelovo..... 59°11'N., 39°07'E.	Concrete..... 11,500 x 250 590	BEAR.....	Military. POL capacity: 6,780,000 gal. Naval heavy reconnaissance bomber base.
Kuybyshev/Bezmyanka..... 53°14'N., 50°20'E.	Concrete..... 9,200 x 350 130	.....do.....	Joint. POL capacity: <i>na</i> . Test and flying field for adjoining aircraft factories.
Leningrad..... 59°48'N., 30°18'E.	Concrete..... 11,200 x 230 65	CAMEL.....	Civil. POL capacity: <i>na</i> . Main civil airfield for Leningrad.
Malyavr..... 68°52'N., 33°44'E.	Concrete..... 8,200 x 260 600	BADGER.....	Military. POL capacity: 4,600,000 gal. Naval medium bomber base.
Minsk/Machulishche..... 53°46'N., 27°35'E.	Concrete..... 9,800 x 220 670	BLINDER.....	Military. POL capacity: <i>na</i> . SAF medium bomber and fighter base.
Mirgorod..... 49°56'N., 33°39'E.	Concrete..... 8,200 x 250 410	BADGER.....	Military. POL capacity: <i>na</i> . SAF medium bomber base.
Moscow/Domodedovo..... 55°24'N., 37°53'E.	Concrete..... 11,500 x 260 550	CLEAT.....	Civil. POL capacity: <i>na</i> . Newest of Moscow's 3 major civil airports.
Moscow/Ramenskoye..... 55°34'N., 38°07'E.	Concrete..... 18,000 x 360 400	est BOUNDER.....	Joint. POL capacity: <i>na</i> . Main research, development, and flight test center. Longest paved runway in the U.S.S.R.
Moscow/Sheremet'yevo..... 55°58'N., 37°25'E.	Concrete..... 11,500 x 260 623	CLEAT.....	Civil. POL capacity: 6,000,000 gal. Main international airport of entry.
Moscow/Vnukovo..... 55°35'N., 37°16'E.	Asphalt..... 10,000 x 190 640	.....do.....	Civil. POL capacity: <i>na</i> . One of Moscow's 3 major civil airports; used mainly for domestic flights.
Mozdok..... 43°47'N., 44°36'E.	Concrete..... 11,500 x 300 470	BEAR.....	Military. POL capacity: 3,000,000 gal. (min.). SAF heavy bomber base.
Mys Shmidt..... 68°52'N., 179°22'W.	Concrete..... 8,200 x 270 80	BISON.....	Joint. POL capacity: 27,200,000 gal. One of the most important SAF staging bases in the Arctic; also used by Aeroflot.
Nezhin..... 51°05'N., 31°52'E.	Concrete..... 9,800 x 260 420	BADGER.....	Military. POL capacity: <i>na</i> . SAF medium bomber base.
Novosibirsk/Tolmachevo..... 55°01'N., 82°39'E.	Concrete..... 11,500 x 300 390	CAMEL.....	Joint. POL capacity: <i>na</i> . Main civil airport for Novosibirsk; SAF fighter base and aircraft repair depot.

Footnotes at end of table.

FIGURE 44. SELECTED MAJOR AIRFIELDS (Continued)

25X1

NAME AND LOCATION	LONGEST RUNWAY: SURFACE; DIMENSIONS; ELEVATION ABOVE SEA LEVEL	RUNWAY LOAD CAPACITY (LARGEST AIRCRAFT SUPPORTABLE)	REMARKS**
	<i>Feet</i>		
Oktyabr'skoye..... 45°19'N., 34°06'E.	Concrete..... 8,200 x 200 260	BADGER.....	Military. POL capacity: <i>na.</i> Naval medium bomber base.
Olenegorsk..... 68°09'N., 33°28'E.	Concrete..... 11,500 x 260 650	BISON.....	Military. POL capacity: 8,200,000 gal. Naval medium bomber and Arctic staging base.
Omsk Southwest..... 54°58'N., 73°18'E.	Permanent..... 8,200 x 270 300	CAMEL.....	Joint. POL capacity: <i>na.</i> Main civil airport for Omsk; also used by SAF.
Orsha Southwest..... 54°26'N., 30°18'E.	Concrete..... 8,200 x 290 640	BADGER.....	Military. POL capacity: <i>na.</i> SAF medium bomber base.
Ostrov/Gorokhovka..... 57°18'N., 28°26'E.	Concrete..... 9,500 x 260 250	BLINDER.....	Military. POL capacity: <i>na.</i> Naval medium bomber base.
Petrovavlovsk/Yelizovo..... 53°10'N., 158°27'E.	Concrete..... 8,200 x 200 270	BADGER.....	Joint. POL capacity: <i>na.</i> Naval medium bomber and SAF fighter base; also used by Aeroflot.
Poltava..... 49°38'N., 34°29'E.	Concrete..... 9,800 x 250 500	.....do.....	Military. POL capacity: 3,000,000 gal. SAF medium bomber base.
Priluki..... 50°35'N., 32°19'E.	Concrete..... 8,200 x 250 440	.....do.....	Military. POL capacity: <i>na.</i> SAF medium bomber base.
Romanovka West..... 43°14'N., 132°20'E.	Concrete..... 8,200 x 220 90	.....do.....	Military. POL capacity: <i>na.</i> Naval medium bomber base.
Ryazan'/Dyagilevo..... 54°38'N., 39°34'E.	Concrete..... 9,800 x 260 420	.....do.....	Joint. POL capacity: <i>na.</i> SAF medium bomber base and main civil airport for Ryazan.'
Saki..... 45°06'N., 33°36'E.	Concrete..... 10,500 x 200 40	.....do.....	Military. POL capacity: <i>na.</i> Naval medium bomber base.
Severomorsk..... 69°02'N., 33°26'E.	Concrete..... 9,800 x 260 230	BEAR.....	Military. POL capacity: 7,400,000 gal. Naval medium bomber base.
Siauliai..... 55°54'N., 23°24'E.	Concrete..... 11,500 x 260 420	BISON.....	Military. POL capacity: <i>na.</i> SAF fighter base.
Sol'tsy..... 58°08'N., 30°20'E.	Concrete..... 9,800 x 260 130	BADGER.....	Military. POL capacity: <i>na.</i> SAF medium bomber base.
Spassk-Dal'niy East..... 44°37'N., 132°53'E.	Concrete..... 10,000 x 260 320	.....do.....	Military. POL capacity: <i>na.</i> SAF medium bomber and fighter base.
Stryy..... 49°15'N., 23°47'E.	Concrete..... 8,200 x 200 1,020	.....do.....	Military. POL capacity: <i>na.</i> SAF medium bomber and fighter base.
Tartu..... 58°24'N., 26°46'E.	Concrete..... 8,200 x 290 210	.....do.....	Military. POL capacity: <i>na.</i> SAF medium bomber base.
Tashkent..... 41°19'N., 69°23'E.	Concrete..... 8,200 x 240 1,500	CLEAT.....	Joint. POL capacity: <i>na.</i> Test and flyway field for the adjoining aircraft factory. Used by SAF and Soviet aircraft industry.
Tashkent South..... 41°15'N., 69°17'E.	Concrete..... 13,200 x 200 1,385	.....do.....	Joint. POL capacity: <i>na.</i> Main civil airfield for Tashkent; also used by military transports.
Tiksi..... 71°42'N., 128°54'E.	Concrete..... 8,200 x 220 50	BISON.....	Joint. POL capacity: 27,400,000 gal. One of the most important SAF Arctic staging bases; also used by Aeroflot and SAF fighters.
Ukraina..... 51°10'N., 128°27'E.	Concrete..... 11,500 x 260 750	.....do.....	Military. POL capacity: 2,000,000 gal. SAF heavy and medium bomber base.

Footnotes at end of table.

FIGURE 44. SELECTED MAJOR AIRFIELDS (Continued)

25X1

NAME AND LOCATION	LONGEST RUNWAY: SURFACE; DIMENSIONS; ELEVATION ABOVE SEA LEVEL	RUNWAY LOAD CAPACITY (LARGEST AIRCRAFT SUPPORTABLE)	REMARKS**
	Feet		
Ussuriysk/Vozdvizhenka..... 43°54'N., 131°56'E.	Concrete..... 9,800 x 270 70	BADGER.....	Military. POL capacity: 2,700,000 gal. SAF medium bomber base.
Uzin/Chepelevka..... 49°47'N., 30°26'E.	Concrete..... 11,500 x 330 570	BEAR.....	Military. POL capacity: na. SAF heavy bomber base.
Veseloje..... 45°35'N., 34°17'E.	Concrete..... 8,200 x 260 110	BADGER.....	Military. POL capacity: na. Naval medium bomber base.
Zhitomir/Skomorokhi..... 50°09'N., 28°44'E.	Concrete..... 9,800 x 250 740	.....do.....	Military. POL capacity: na. SAF medium bomber base.

na Data not available.

*The selected major airfields are shown on the Summary Map.

**POL capacities are estimated.

FIGURE 45. OTHER IMPORTANT AIRFIELDS

25X1

NAME AND LOCATION	RUNWAY*	USAGE	NAME AND LOCATION	RUNWAY*	USAGE
Afrikanda..... 67°27'N., 32°47'E.	8P	M	Chekurovka..... 71°04'N., 127°21'E.	13T	J
Alma-Ata..... 43°21'N., 77°02'E.	14P	J	Chelyabinsk/Balandino..... 55°18'N., 61°30'E.	10P	C
Anderma..... 69°46'N., 61°34'E.	8P	J	Chernyakhovsk..... 54°36'N., 21°47'E.	8P	J
Andizhan..... 40°44'N., 72°17'E.	8P	J	Chimkent..... 42°22'N., 69°28'E.	8P	M
Andreapol..... 56°39'N., 32°19'E.	8P	M	Chirchik..... 41°31'N., 69°35'E.	7P	M
Arkhangel'sk..... 64°27'N., 40°25'E.	6P	M	Chita Northwest..... 52°04'N., 113°26'E.	8P	M
Arkhangel'sk/Talagi..... 64°36'N., 40°43'E.	8P	J	Chita/Kadala..... 52°01'N., 113°19'E.	9P	C
Armavir..... 44°58'N., 41°06'E.	8P	M	Chokurdakh..... 70°37'N., 147°54'E.	6P	J
Ashkhabad/Bezmein..... 38°01'N., 58°12'E.	8P	M	Chortkov..... 48°59'N., 25°44'E.	8P	M
Ashkhabad Northwest..... 37°59'N., 58°22'E.	9P	J	Chuguyev..... 49°50'N., 36°39'E.	8P	M
Aspidnoye..... 69°22'N., 161°33'E.	14T	M	Dallyar..... 40°53'N., 45°57'E.	7P	M
Astrakhan' Northwest..... 46°24'N., 47°54'E.	8P	M	Daugavpils Northeast..... 55°57'N., 26°40'E.	8P	M
Baku/Bina..... 40°28'N., 50°03'E.	9P	J	Dnepropetrovsk/Voloshkoye..... 48°21'N., 35°06'E.	7P	J
Baku/Kala..... 40°25'N., 50°12'E.	6P	M	Dobrynskoye..... 56°15'N., 40°35'E.	7P	M
Bereza..... 52°33'N., 24°53'E.	8P	M	Dolinsk..... 47°16'N., 142°46'E.	8P	J
Bezhet'sk..... 57°44'N., 36°39'E.	8P	M	Dombarovskiy..... 50°48'N., 59°31'E.	7P	M
Blagoyevo..... 46°54'N., 30°42'E.	8P	M	Dzhankoy..... 45°42'N., 34°25'E.	6P	M
Bobrovichi..... 52°17'N., 29°21'E.	8P	M	Fergana..... 40°21'N., 71°44'E.	7P	J
Bobrovka..... 53°09'N., 50°43'E.	8P	M	Galenki Northeast..... 44°06'N., 131°49'E.	8P	M
Borisovskiy..... 57°39'N., 34°06'E.	8P	M	Gdov..... 58°49'N., 28°01'E.	8P	M
Burevestnik..... 44°55'N., 147°38'E.	7P	J	Gissar..... 38°31'N., 68°40'E.	8P	M

Footnotes at end of table.

FIGURE 45. OTHER IMPORTANT AIRFIELDS (Continued)

25X1

NAME AND LOCATION	RUNWAY*	USAGE	NAME AND LOCATION	RUNWAY*	USAGE
Gorodok..... 49°44'N., 23°40'E.	8P	M	Kroohevitsy..... 58°38'N., 31°23'E.	6P	M
Gromovo..... 60°43'N., 30°07'E.	8P	M	Krichev..... 53°44'N., 31°55'E.	8P	M
Groznyy East..... 43°18'N., 45°47'E.	8P	M	Krivoy Rog East..... 47°53'N., 33°32'E.	7P	M
Gudauta..... 43°06'N., 40°35'E.	7P	J	Krustpils..... 56°32'N., 25°53'E.	6P	M
Irkutsk Northwest..... 52°22'N., 104°11'E.	8P	J	Krymsk..... 44°58'N., 38°00'E.	8P	M
Ivano-Frankovsk..... 48°53'N., 24°42'E.	6P	J	Kubinka..... 55°37'N., 36°39'E.	8P	J
Kaliningrad/Yezau..... 54°34'N., 20°36'E.	8P	M	Kupino..... 54°21'N., 77°22'E.	8P	M
Kamyshin Northwest..... 50°12'N., 45°12'E.	8P	M	Kuybyshev/Kurumoch..... 53°30'N., 50°09'E.	8P	C
Karshi/Khanabad..... 38°50'N., 65°55'E.	8P	M	Kyurdamir..... 40°17'N., 48°10'E.	8P	M
Kazi Magomed..... 40°02'N., 48°54'E.	6P	M	Kyzylagadzh..... 39°01'N., 48°48'E.	6P	M
Kedainiai..... 55°19'N., 23°58'E.	6P	J	Leningrad/Gorelovo..... 59°46'N., 30°05'E.	8P	M
Kem'/Uzhmana..... 64°55'N., 34°15'E.	8P	M	Lida..... 53°53'N., 25°23'E.	8P	M
Kereh'/Bagerovo..... 45°25'N., 36°15'E.	11P	M	Limanskoye..... 46°40'N., 30°01'E.	8P	M
Khabarovsk/Blagodatnoye..... 48°25'N., 135°25'E.	7P	M	Lodeynoye Pole..... 60°43'N., 33°34'E.	8P	M
Khar'kov..... 49°56'N., 36°18'E.	5P	J	Luchki..... 44°13'N., 132°13'E.	7T	M
Khar'kov North..... 50°02'N., 36°16'E.	5P	J	Lugovoye..... 42°58'N., 72°44'E.	8P	M
Kiev/Zhulyany..... 50°24'N., 30°27'E.	5P	J	Magadan Northwest..... 59°55'N., 105°44'E.	9P	J
Kilpyavr..... 69°06'N., 32°24'E.	8P	M	Makharadze..... 41°56'N., 41°52'E.	7P	M
Kirovabad..... 40°44'N., 46°19'E.	7P	M	Marinovka..... 48°38'N., 43°47'E.	8P	M
Kirovskoye..... 45°10'N., 35°11'E.	8P	M	Markuleshty..... 47°52'N., 28°13'E.	8P	M
Kizyl-Arvat..... 38°59'N., 56°22'E.	7P	M	Mary North..... 37°40'N., 61°50'E.	8P	M
Klyuchevoye..... 60°28'N., 28°45'E.	6P	M	Mary Northeast..... 37°37'N., 61°54'E.	8P	M
Kokayty..... 37°37'N., 67°31'E.	7P	M	Melitopol'..... 46°53'N., 35°18'E.	8P	M
Kolomyia..... 48°32'N., 25°08'E.	6P	J	Mikha-Tskhakaya..... 42°14'N., 42°03'E.	7P	M
Komsomol'sk..... 50°36'N., 137°05'E.	8P	J	Mineral'nyye Vody..... 44°13'N., 43°05'E.	10P	C
Komsomol'sk South..... 50°24'N., 136°56'E.	6P	M	Monchegorsk..... 67°59'N., 33°01'E.	7P	M
Kramatorsk..... 48°42'N., 37°38'E.	8P	M	Morshansk..... 53°26'N., 41°44'E.	7P	M
Krasnodar..... 45°05'N., 38°57'E.	8P	M	Moscow/Shchelkovo..... 55°53'N., 38°03'E.	11P	M
Krasnovodsk..... 40°04'N., 53°00'E.	8P	J	Mukachevo..... 48°24'N., 22°41'E.	8P	M

Footnotes at end of table.

25X1

FIGURE 45. OTHER IMPORTANT AIRFIELDS (Continued)

NAME AND LOCATION	RUNWAY*	USAGE	NAME AND LOCATION	RUNWAY*	USAGE
Nasosnyy..... 40°35'N., 48°34'E.	8P	M	Sal'yany..... 39°39'N., 48°59'E.	7P	M
Natal'iya..... 76°50'N., 08°25'E.	13N	M	Samtredia East..... 42°11'N., 42°29'E.	7P	M
Nebit-Dag..... 39°29'N., 54°22'E.	8P	M	Sandagou..... 44°05'N., 133°52'E.	6P	M
Nikolayov/Kul'Bakino..... 45°56'N., 32°06'E.	11P	M	Sangachaly..... 40°08'N., 49°27'E.	7P	M
Nikolayevka..... 43°05'N., 133°12'E.	6P	M	Saratov West..... 51°32'N., 45°51'E.	6P	M
Nizhniy Tagil Northeast..... 57°59'N., 60°14'E.	8P	M	Sary Shagan..... 46°02'N., 73°30'E.	9P	M
Noril'sk Northwest..... 69°23'N., 87°53'E.	14T	M	Semipalatinsk..... 50°21'N., 80°14'E.	10P	J
Novorossiysk..... 43°21'N., 132°34'E.	6P	M	Sernovodsk..... 43°57'N., 145°42'E.	6T	J
Novosibirsk Northeast..... 55°05'N., 83°00'E.	10P	J	Sevastopol'/Bel'bek..... 44°41'N., 33°34'E.	8P	M
Oborzerskiy Southeast..... 63°23'N., 40°24'E.	8P	M	Shchuchin..... 53°36'N., 24°46'E.	8P	M
Odessa Central..... 46°26'N., 30°41'E.	9P	J	Simferopol' North..... 45°02'N., 33°59'E.	9P	J
Omsk East..... 54°58'N., 73°33'E.	9P	J	Sital-Chay..... 40°49'N., 49°26'E.	6P	M
Orël Southwest..... 52°56'N., 36°00'E.	6P	M	Smirnykh..... 49°44'N., 142°52'E.	8P	M
Osinovka..... 44°01'N., 132°13'E.	8P	M	Smolensk..... 54°49'N., 32°02'E.	6P	J
Ovruch..... 51°19'N., 28°51'E.	6P	M	Sovetskaya Gavan'/Vanino..... 49°02'N., 140°14'E.	6P	M
Panevezys..... 55°44'N., 24°28'E.	6P	M	Starokonstantinov..... 49°45'N., 27°16'E.	6P	M
Parnu..... 58°25'N., 24°28'E.	8P	M	Sverdlovsk/Koltsovo..... 56°45'N., 60°49'E.	7P	J
Perm/Bolshesavino..... 57°55'N., 56°02'E.	6P	M	Tallinn/Lasnamae..... 59°27'N., 24°53'E.	6P	M
Petrozavodsk Northwest..... 61°53'N., 34°09'E.	8P	M	Tapa..... 59°14'N., 25°57'E.	8P	M
Pirsagat..... 39°51'N., 49°20'E.	6P	M	Tbilisi/Marneuli..... 41°28'N., 44°47'E.	8P	M
Pochinok..... 54°20'N., 32°28'E.	8P	J	Tbilisi/Novo Alekseyevka..... 41°40'N., 44°57'E.	8P	J
Postavy..... 55°07'N., 26°46'E.	8P	M	Tbilisi/Vaziani..... 41°38'N., 45°02'E.	8P	M
Pravdinsk..... 56°31'N., 43°29'E.	8P	M	Tiksi West..... 71°42'N., 128°42'E.	13T	M
Provideniya/Urelik..... 64°23'N., 173°15'W.	7T	J	Tiraspol..... 46°52'N., 29°36'E.	8P	M
Pushkin..... 59°41'N., 30°20'E.	8P	J	Troitsk..... 54°07'N., 61°32'E.	6P	M
Riga West..... 56°56'N., 23°58'E.	6P	M	Tukums..... 56°57'N., 23°13'E.	8P	M
Riga/Rumbula..... 56°53'N., 24°14'E.	6P	J	Tula North..... 54°14'N., 37°36'E.	6P	M
Ross..... 53°18'N., 24°22'E.	8P	M	Tyura Tam I..... 45°37'N., 63°13'E.	10P	M
Rzhev..... 56°16'N., 34°25'E.	8P	M	Uglovoye Northwest..... 43°21'N., 132°04'E.	8P	M

Footnotes at end of table.

FIGURE 45. OTHER IMPORTANT AIRFIELDS (Continued)

25X1

NAME AND LOCATION	RUNWAY*	USAGE	NAME AND LOCATION	RUNWAY*	USAGE
Ul'yanovsk Southwest..... 54°16'N., 48°14'E.	8P	C	Vyborg East..... 60°41'N., 29°10'E.	7P	M
Unashi..... 42°57'N., 133°07'E.	8P	M	Yakutsk..... 62°05'N., 129°46'E.	8P	C
Vainode..... 56°24'N., 21°53'E.	8P	M	Yaroslavl'/Tunoshnoye..... 57°34'N., 40°09'E.	8P	M
Vasalemma..... 59°16'N., 24°12'E.	6P	M	Yefremov..... 53°07'N., 38°15'E.	8P	M
Vasil'kov..... 50°14'N., 30°18'E.	6P	M	Yerevan/Parakar..... 40°09'N., 44°24'E.	10P	C
Velikaya-Kema..... 45°30'N., 137°11'E.	8T	M	Yoshkar-Ola..... 56°40'N., 48°02'E.	7P	J
Verino..... 48°00'N., 135°05'E.	8P	M	Zaporozh'ye East..... 47°52'N., 35°19'E.	8P	M
Volgograd/Gumrak..... 48°47'N., 44°21'E.	6P	J	Zavitinsk Northeast..... 50°11'N., 129°30'E.	10P	M
Vorkuta East..... 67°28'N., 64°18'E.	13T	M	Zemo Kedi..... 41°23'N., 46°22'E.	8P	M
Voznesensk..... 47°31'N., 31°15'E.	8P	M			

*Runway length in thousands of feet.

Abbreviations:

C..... Civil.

J..... Joint Military-Civil.

M..... Military.

N..... Natural (ice, packed snow, or unimproved turf).

P..... Permanent (concrete, asphalt, bitumen-bound macadam, brick).

T..... Temporary (water-bound macadam, graded earth, steel mat, graded gravel).

J. Telecommunications

Telecommunications are particularly important in the U.S.S.R. because of the highly centralized government control system and the need to maintain rapid communications with civil and military authorities located in all parts of the vast country. Developments have been determined by the political, economic, and military requirements of the state rather than by the needs of the general public. Consequently, telecommunication (telecom) facilities are unevenly distributed, and many communities have no services. In recent years, the establishment of a modern and versatile telecom system capable of providing efficient services for the entire country has been one of the primary goals of the government. All telecom facilities are government owned; most are controlled and operated as state enterprises.

The major national complex of the Soviet Union is known as the Unified Communications System of the U.S.S.R. This system forms a comprehensive and relatively modern structure which supports the state requirements and also affords limited services to private citizens. Facilities of the unified system include extensive wire and radio transmission networks; automatic, semiautomatic, and manual terminals; and broadcast installations. The Soviets also utilize communication satellites to supplement the conventional, ground-based transmission media. Telecom services available include telephone, telegraph, telex (teletypewriter subscriber service), facsimile, data transfer,

AM and FM radiobroadcasting, wired broadcast, ^{25X1} and television. Moscow is the major switching and control center for the entire system and has the greatest concentration of facilities.

The overall telecom structure of the U.S.S.R. is extensive and very similar to modern systems found in other industrially developed countries. Communication terminal facilities are still undergoing modernization and expansion, however, and the availability of adequate and efficient telephone services is somewhat limited. Most of the major Soviet urban and industrial centers are interconnected by means of modern intercity transmission networks, but the overall effectiveness of these networks is hampered by the predominance of slow and inefficient long-distance telephone-switching equipment. In many parts of the country local telephone systems are working at full capacity, and the systems are not capable of accommodating new subscribers. Modern automatic and semiautomatic telephone exchanges are being installed continually, but distribution of telephones and access to intercity services are still handled on a priority basis. Telegraph communication is more readily available to most areas of the country, and telex and facsimile services generally are provided by the main urban telegraph offices. Adequate international communication services are available to most world centers.

The U.S.S.R. has the second most powerful AM radiobroadcast system in the world, being surpassed only by the United States. Radiobroadcast services for domestic and foreign audiences are provided by

efficient and extensive networks of AM stations operating on low, medium, and high frequencies (LF, MF, HF). FM broadcast facilities are less extensive, but new stations are being established in conjunction with TV development through joint use of antenna towers and other facilities. TV facilities have been developed under high-priority expansion efforts, and well-developed networks are in operation. Wired-broadcast networks are located throughout the country; most small rural communities are served by this medium.

Nominally, the Council of Ministers of the Soviet Union is the final authority for all civil and military telecom matters and makes the decisions on high-level planning and policies. Central telecom management is vested in the Ministry of Communications (MOC) of the U.S.S.R., with headquarters at 7 Ulitsa Gor'kogo, Moscow. Several national-level ministries, departments, and agencies are involved in the final decisionmaking processes concerning general and special-purpose communication requirements, equipment supply, technical standards, education, security, and miscellaneous coordinating and planning functions. The Ministry of Defense is known to exert a strong influence on new construction and planning, and probably makes direct budgetary contributions to the MOC for the construction of facilities that are to be used largely by the military. The State Committee for Television and Radio Broadcasting is responsible for broadcast and telecast program content and for the international exchange of programs.

Administration of communications is organized on a union republic basis, with the national MOC responsible for the system as a whole and supported by 14 subordinate republic ministries of communications. Responsibilities of the MOC are defined in a charter promulgated by the Council of Ministers. The charter charges the MOC with responsibility for general management problems pertaining to all forms of communications including planning, construction, operation, maintenance, and quality of services provided, and for direct operational control over all common-user facilities (including circuit allocations) of national significance. The MOC also is responsible for the technical control of facilities maintained by other economic organizations.

Republic ministries are subordinate to the Council of Ministers as well as to the MOC. These ministries are responsible for the development and functioning of all installations within their respective areas of jurisdiction, including those within the lower-level *oblast* and *rayon* administrative territories. Below republic level, communication directorates in the *oblast* and *rayon* centers are responsible for services to the various subscribers. All R.S.F.S.R. telecom facilities are controlled by the national MOC through 72 communication administrations in *krais*, *oblasts*, autonomous republics, and autonomous *oblasts*.

The Soviet Government exercises a strong influence on the content of telecom traffic. All international transmissions are monitored and censored, and all

incoming traffic is filtered through government channels. Censorship is primarily the responsibility of the Committee for State Security (KGB), which also has the function of observing employees of the Ministry of Communications; censoring letters, telegrams, and literature; monitoring telephone calls; and operating the government's secure telephone system. Employees of the KGB are stationed in every major governmental department and in industrial enterprises, often as an integral part of the organization to which they are assigned.

The Unified Communications System is the major domestic telecom complex of the Soviet Union. It is a nationwide system that includes a number of integrated subsystems which provide both general and special-purpose services. Extensive networks of cable and open-wire lines, radio-relay links, radiocommunication stations, communication satellites, and associated terminal installations are incorporated into the system. The network facilities are divided into two main categories: 1) general-purpose facilities which form the basic national common-user complex affording telecom services for all subscribers, and 2) special-purpose facilities of independent functional networks. The common-user complex provides telephone, telegraph, telex, facsimile, data transfer, intercity broadcast and TV program transmission,⁵ and leased circuits for special purposes. Independent functional networks are formed by the leased circuits, plus separate facilities maintained and operated by the individual users. Other domestic networks also are maintained for secure communications between high-level authorities.

Facilities of the unified system are capable of fulfilling most requirements. Constantly increasing demands for more and better communication services, however, are a continuing problem for Soviet telecom planners. The pattern of network development largely has been controlled by the amount of government activity in a specific area and the resulting need for good communications. Consequently, most of the modern facilities serve the European U.S.S.R. and the main government control and economic centers in Soviet Central Asia. In the far eastern and arctic regions of the country, telecom facilities still are unevenly distributed and many outlying communities have no services.

High-quality telecom connections are available between Moscow and most of the more important centers of the country. Traffic-handling capabilities are somewhat limited because modernization of many main terminal installations is incomplete, and not all trunk routes have an adequate channel capacity. In 1969, intercity telephone traffic amounted to 375 million long-distance calls, as compared with a total of 345 million intercity calls in East Germany and 395.4 million calls in Poland. The majority of intercity

⁵Coaxial cables, broadband radio-relay links, and communication satellite facilities are the only transmission media with sufficient bandwidth for TV program transmission.

telephone traffic in the U.S.S.R. is handled on a strict priority basis in which political, military, and administrative authorities receive first priority. Official traffic is handled with a minimum of delay, regardless of the distances involved, but messages of the average citizen are handled after peak traffic hours and may be delayed for as long as 24 hours. Telegraph communication is more readily available to most areas of the country; in 1969, 355 million domestic telegrams were handled, as compared with a combined total of 69.4 million domestic telegrams in Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania.

General-purpose intercity facilities which form the common-user system include a compatible mixture of new and old wire and radio transmission media. This system is designed to interconnect Moscow with capitals of all union republics, major urban centers, small rural and urban areas in the vicinity of major centers, and, to a limited degree, remote communities. The common-user system is subdivided into national (mainline), intrarepublic, *intraoblast*, and *intrarayon* subsystems. Mainline trunk routes are designed for extremely long-distance, heavy-duty communications and interconnect the larger and more important cities. Intrarepublic and *intraoblast* subsystems comprise the long- and medium-distance regional and district facilities, and *intrarayon* networks include the secondary, short-haul rural lines.

New standard mainline transmission facilities include a basic framework of buried high-capacity coaxial and multiconductor cables, and line-of-sight broadband radio-relay and tropospheric-scatter relay installations. Communication satellites and stations of the associated ground-control and receive network are also a part of the new facilities. Older mainline facilities are a combination of cable, open-wire lines, and radiocommunication stations. The coaxial cables and broadband radio-relay installations on major trunk routes are capable of accommodating up to 1,920 two-way telephone conversations, or 300 to 600 telephone conversations and two TV channels. With suitable equipment, each telephone channel can be used for 18 to 24 telegraph channels. The Soviets are testing a new high-capacity broadband radio-relay system which can be used for 10,000 telephone channels plus television over distances of 6,000 kilometers. This system, designated *Druzhba*, was jointly developed by the U.S.S.R. and Hungary. The Soviets also have completed the design of a broadband radio-relay system designated *Voskhod*. This system will be capable of accommodating multichannel telephone plus color TV transmissions.

Tropospheric-scatter relay links are being used to traverse the more remote and not easily accessible northern areas of the country and to span large bodies of water. The use of tropospheric scatter is particularly advantageous in areas with difficult terrain and adverse climate because the relay stations can be spaced at intervals of from 200 to 400 kilometers. Additional advantages include reasonably reliable transmission in

regions with auroral atmospheric disturbances as well as the ability to provide multichannel connections to communities where HF radio formerly provided the sole means of communication. The Soviet tropospheric-relay equipment operates in the 800- to 1,000-megahertz frequency range and is capable of transmitting 60 telephone channels.

The Soviet communications satellite system consists of two main transmit-and-receive control stations located in the Moscow and Vladivostok areas; a network of approximately 30 ground-receive stations designated *Orbita*; and active, nonsynchronous radio-relay earth satellites designated *Molniya 1* (Lightning 1). Ground station facilities of the communication satellite system are still being developed. Regular exchange of multichannel communications plus TV programs is restricted to the two main terminals in Moscow and Vladivostok, while the *Orbita* stations are being used for TV reception only. Projects are underway to provide existing *Orbita* stations with facilities for the reception of facsimile messages plus other modes of communications. Additional transmit-receive ground-control stations also are scheduled for construction. Plans are also underway to establish a stationary, synchronous earth satellite system. A *Molniya 1* satellite is shown in Figure 46.

Lower level intercity networks of the common-user structure are characterized by a maze of primary and



FIGURE 46. *Molniya 1* communication satellite. Satellites of this type relay TV programs to the eastern and northern U.S.S.R.

25X1

alternate medium- and low-capacity routes functioning as feeders for the mainline trunks. Selection of facility types depends on the geographic location and population density. Thus, in highly populated areas new medium-capacity radio-relay links suitable for both message and TV program transmission are supplemented by modern cables as well as by older rehabilitated cables, open-wire lines, and radiocommunication stations. In the more remote and sparsely populated areas, limited open-wire line facilities supplemented by radiocommunication stations remain as the basic means of communications between distant points.

Intercity switching systems include a combination of radial and radial-junction switching. With this arrangement, intercity connections are made from the local long-distance exchanges to the nearest primary or secondary tandem switching points, from where traffic is either routed directly or relayed through appropriate switching centers to the desired location. Equipment in long-distance switching centers includes automatic, semiautomatic, and manual devices, with a predominance of manual types in the telephone exchanges. In many outlying communities the only access to the long-distance telephone system consists of centrally located public pay stations.

Local area facilities include the urban and rural telephone subsystems and urban telegraph nets. In many parts of the country local telephone systems are working at full capacity, and the systems are not capable of accommodating new subscribers. Modern automatic and semiautomatic telephone exchanges are being installed continually, but distribution of telephones is still handled on a priority basis. With an estimated 9.9 million (74% automatic) general-purpose telephones in service at the beginning of 1969, the Soviet Union placed fifth worldwide in the number of telephones. However, on a per capita basis the U.S.S.R. had only 4.14 sets per 100 population as compared with 4.50 and 5.08 sets per 100 population in Bulgaria and Poland, respectively.

Adequate international telecom services are provided over landlines, radio-relay links, radiocommunication circuits, and submarine cables. Although several major cities have facilities for international service, most of the traffic is handled by Moscow installations. Landline and radio-relay networks carry the bulk of international telephone and telegraph traffic to European and bordering Asian countries. International radiocommunication facilities provide telephone, regular telegraph, telex, and facsimile services to most worldwide centers. The U.S.S.R. has interconnections with the European Centex (general telegraph traffic network) and the semiautomatic telephone dialing networks, and Moscow functions as a major switching center for the intracontinental transit traffic.

Landlines and radio-relay links are a continuation of the domestic common-user complex, with the more important connections concentrated in the European

U.S.S.R. The most significant link is an underground coaxial cable from Moscow via Kiyev and L'vov to Poland, Czechoslovakia, and East Germany. A second major coaxial cable interconnects Moscow with Finland via Leningrad and Vyborg. International radiocommunication facilities are controlled through the Moscow Radio Bureau. The major transmitting and receiving stations for these services are located at various sites in the Moscow area. Radio facilities at Alma-Ata, Irkutsk, Tashkent, Khabarovsk, and Vladivostok are also employed in international service.

The Soviets have international submarine cable connections with Bulgaria, Finland, Poland, North Korea, and Romania. Most of these cables are old, have limited carrying capability, and are no longer in use. By contractual agreement, four European and two Asian submarine telegraph cables owned by the Great Northern Telegraph Co., Ltd. (GNT), of Denmark land on U.S.S.R. territory. These cables interconnect Denmark with Finland and Japan. In accordance with an agreement among the U.S.S.R., GNT, and Japan, the laying of a submarine coaxial telephone cable between Nakhodka and Naoetsu, Japan, was completed in April 1969. The new cable replaces the older Asian telegraph cables originally laid by GNT and provides 60 two-way telephone channels which also can be used for telegraph, telex, and facsimile services. Connections to Europe are provided by circuits leased from the U.S.S.R. Because the GNT European submarine telegraph cables have limited capacity, most of the transit traffic is carried by Soviet landline circuits extending into Finland.

Extensive nationwide independent functional communication networks are maintained for safety and control of air and marine navigation, railroad operations, electric power networks, gas and oil pipeline systems, police and military forces, and many other special-purpose activities. Most functional networks are an integral part of the Unified Communications System, but they also include separate landlines, radio-relay links, a large number of radiocommunication stations, and a variety of terminal facilities. Since these networks are interconnected with the basic common-user complex, they can be used as supplementary or emergency communication media whenever necessary. Moscow is the main control center for most of the functional communication facilities.

Broadcast facilities in the U.S.S.R. are used primarily to circulate the official views and policies of the central government and only secondarily to inform and entertain. Major domestic and international programs originate in Moscow and are carried by extensive national AM and FM radiobroadcast, wired-broadcast, and TV network facilities. Additionally, programs of regional or local interest originate in the capital cities of the union republics and other important centers throughout the country. The Soviets have comprehensive radio-jamming facilities which can be used effectively to block out undesired programs from other countries.

The AM radiobroadcast complex includes an estimated 135 main network transmitter stations which broadcast for a total of 1,200 hours a day. These stations are equipped with at least 500 LF, MF, and HF transmitters with powers up to 500 kilowatts. The existing stations have sufficient power to provide effective coverage on a worldwide basis and these facilities are being steadily expanded and improved. In aggregate transmitter power output the Soviet Union ranks second to the United States.

FM radiobroadcast stations and wired-broadcast networks complement the AM broadcast complex. FM broadcast facilities are being emphasized for local coverage in main urban areas and new stations are being established in conjunction with the construction of TV centers. Approximately 165 cities and large towns are served by FM radiobroadcast stations.

There are 46 types of radiobroadcast receivers ranging from inexpensive transistorized sets for LF and MF reception to larger, expensive all-wave sets for AM and FM reception. Both battery-operated and plug-in sets for alternating household current are available. An estimated 47 million receivers are in use.

Wired-broadcast networks are located throughout the country; most small rural communities are served by this medium. The Soviet wired-broadcast system, after more than 40 years of development, is approaching saturation level and has gradually fallen behind radiobroadcasting in terms of the number of reception points. Prior to 1963 the majority of listeners received programs over individual wired-broadcast sets and community loudspeakers. However, an increase in the production of radio receivers has resulted in a gradual decrease in the distribution and use of wired sets. An estimated 43 million wired receivers are served by approximately 35,000 wired-broadcast distribution centers. The distribution centers receive programs over telephone lines or by radio receivers on direct "off-the-air" pickup. These programs are then fed to amplifying substations and subscriber loudspeakers via buried and overhead landlines which are frequently installed on telephone or power distribution poles.

The Soviet TV system has program-originating centers with transmitters and supplementary high- and low-power rebroadcast (relay) stations. Intercity coaxial cables, radio-relay links, and the *Orbita* earth satellite receiver stations are used to interconnect the stations for network program transmission. Regular programs are transmitted in black and white over 12 channels in the 48.5- to 230-megahertz frequency range; color telecasting is still in the early stages of development. Nearly 1,000 transmitting facilities are in operation, including about 135 centers, 110 high-power rebroadcast stations, and many low-power rebroadcast stations. There were 31,300,000 TV receivers in use in early 1970.

Soviet radio and TV broadcasts also are directed to foreign audiences. Moscow is the major service outlet, with international radiobroadcasts originating in some 82 languages. The Moscow International Service uses at least 82 HF transmitters and 20 MF transmitters.

Effective worldwide coverage is obtained by the use of high-power transmitters and highly efficient directional antenna systems. Among the HF transmitting sites utilized in international services, approximately 11 are in Siberia. The main MF transmitter sites relaying international programs include Dushanbe, Kaliningrad, Kaunas, Khabarovsk, Kiyev, Kishinëv, L'vov, Uzhgorod, Vinnitsa, Vladivostok, and Yerevan. The U.S.S.R. is a member of Intervision, the East European TV network, and also exchanges programs with Eurovision, the West European TV network.

The Soviet telecom complex is being systematically developed through successive programs which are part of a basic master plan. Under this master plan, modern engineering technology is being incorporated on a broad scale with major emphasis being placed on the complete and systematic renovation of the entire telecom complex. The basic concept is to establish a modern, standardized, fully automated system which can be systematically expanded to meet the growing needs of both official and public subscribers. In order to achieve these goals, large-scale telecom redevelopment projects are to be carried out in successive stages through the mid-1980's, when automatic operations are planned to be introduced on a nationwide basis. The most significant development programs include establishing modern high-capacity transmission networks, modernizing and expanding communication terminals, expanding TV and FM broadcast networks, and improving radiocommunication stations and AM radiobroadcast stations. New technology such as communication satellites, color television, and videotelephone services also are being successfully introduced.

Many parts of the telecom system are highly vulnerable to both natural phenomena and manmade interruptions, and the Soviets employ numerous methods to reduce interference from these sources. To prevent sabotage, all important installations are surrounded by fences and most are guarded by military or civilian personnel. The repeater and junction stations of interurban cables are well constructed, and many are underground. Above-ground structures are constructed of brick, concrete, or metal for fireproofing and durability. All cable huts, vaults, and junction boxes are protected by double metal doors. At all river crossings a reserve cable is laid in addition to the main cable. New long-distance cables are laid at sufficient depth to withstand blasts and are shielded to prevent damage by rodents. Ring cables bypass strategic urban centers so that traffic can be diverted during emergencies and, in addition, reserve underground communication centers are maintained.

Unattended radio-relay stations are vulnerable to sabotage, but most of the mainline links are paralleled by landlines. Open-wire lines in many parts of the country are subject to disruption because of adverse climatic conditions, but radio provides backup circuits. The susceptibility of the long-haul HF radio circuits to disruption by unfavorable atmospheric conditions is

compensated by the availability of LF and MF radiocommunication facilities. High-power, special-purpose VLF transmitters also are available for use in an emergency. All of the numerous radio circuits are vulnerable to interception and are susceptible to jamming.

One of the major geographic factors adversely affecting telecom development is the vast area of the country, which necessitates much time and effort for engineering and construction of cables and radio-relay links on major routes. Additionally, construction is often hampered by slow delivery of equipment from distant supply sources.

Climatic conditions adversely affect telecom construction, operation, and maintenance in many parts of the country. Most of the telecom traffic in the permafrost area north of the 60th parallel is handled by radio because of the difficulty in building and maintaining cable and open-wire lines. Permafrost also affects the design and construction of telecom buildings. In the southern Ukraine, the Crimean Peninsula, and the northern Caucasus Mountains, heavy icing conditions and snowstorms cause severe damage to overhead lines and poles. Electrical interferences caused by aurora borealis hamper communications in parts of the country; its effect is greatest above latitude 65° north, although it frequently reaches 50° north, encompassing the Kamchatka Peninsula, northern Sakhalin, and the lower Amur river area.

The total volume of Soviet telecom and electronics industry production is second only to that of the United States. The industry consists of more than 200 plants, with major concentrations in Moscow and Leningrad, which provide the country's major civilian and military

needs. Because of primary emphasis on military requirements, which account for about 70% of production, and on priorities assigned to electronic devices for scientific, industrial, and administrative uses, the industry has not met the equipment requirements for the expansion and modernization of the civil telecom systems. Difficulties and delays in domestic output of some major items, caused in part by a lack of certain high-quality components and the lack of coordination between development and production stages, have led to diversified purchases from worldwide sources of supply.

Soviet imports of telecom equipment reflect the increasing importance of related industries within the East European Communist area; however, non-Communist countries continue to supply diverse types of technically advanced and specialized apparatus. Communist suppliers, in approximate order of importance, are Hungary, East Germany, Czechoslovakia, and Poland. Soviet imports from non-Communist countries include purchases from Japan, the United Kingdom, West Germany, Italy, and France, also in approximate order of importance.

Soviet telecom engineers are well trained and competent, but the demand for skilled manpower is increasing rapidly as more modern and complex facilities are introduced into the system. There are at least 26,000 highly qualified specialists and 84,000 medium-level technicians engaged in various telecom operations. Telecom engineers and technicians are trained in seven institutes and 23 technical colleges of the MOC. Other personnel receive on-the-job training and correspondence courses to improve their capabilities.

4. Sociological

A. General

The character of Soviet society today reflects the forcible imposition of a system of modern revolutionary theories and programs, specifically Western in their dynamism and materialistic in their assumptions, on a profoundly religious congeries of peoples who for centuries lived by essentially static social norms in isolation from the Western world. Impelled by a dynamic philosophy of history, and with a formidable territorial base of operations, the Communists, to maintain power and to push the rapid industrialization of a nation that was largely agrarian and technically backward, established a monopoly of control over all aspects of society. From the party's point of view, all Soviet life is political.

Many of the tensions in Soviet society arise from the fact that the regime has forced upon its citizens ways that are foreign not only to their traditions but to their character. The Russians themselves have been a frank and open people, free in the display of their emotions within defined limits of social control, gregarious and argumentative, given to passionate discussion of the broadest abstractions. They value group membership highly and are dependent upon the group, especially its leaders, but this need cannot be satisfied mechanically or impersonally. Russians seek personal, particularistic relationships. Veering between extremes of work and idleness, deprivation and indulgence, delight and despair, Russians have never been remarkable for the individual orderliness of their lives.

It was such a people that the Communists had to regiment. Rapid industrialization required order and discipline, and the Communist ideology demanded single-minded acceptance of its principles. Resistance led to compulsion and suspicion. Religion was seen as a dangerous force that had to be counteracted. The huge bureaucracy erected by the regime was not geared to offer personal attention. The insistence that the individual had and must fulfill responsibilities to the abstract ideas of the state and party destroyed the traditional linkage between subject and ruler. The Russian, cut off from many traditional sources of personal strength, was forced to hide his emotions, curb his curiosity, work efficiently and consistently, and be very careful about his talk and his associations.

The problems created by the revolution—primarily those of industrialization and the practical application by centralized power of an often inexact and loosely drawn social theory—are still being worked out, and the society is still in flux. Yet, even though control is in the

hands of relatively few people who are capable of drastically changing policy or its implementation at a given moment, there are limits upon the Soviet regime's power. The sources of these limits are found not only in the current ideology and system of political practice but also in prerevolutionary Russian culture and tradition and the imperatives of technological progress. No regime can control a society and remain untouched by the cultural context within which that society functions. The Soviet regime is a Russian government and has had to work with what it inherited. Indeed, its ability to use the cultural heritage has been a major source of strength.

The cultural heritage of the Russian people achieved its basic forms in an agricultural society considerably influenced by Byzantium—a universe unto itself, relatively untouched by the scientific, rational, and industrial currents that swept through the Western world. The Bolsheviks took power over a European people who had broken with serfdom later than any major Western nation, who had maintained a system of absolutist government reinforced by a highly centralized state church, and who had been bypassed by the Renaissance and the Reformation. Isolation of Russia from the West has been an important element in Russian history, just as today the isolation enforced by the regime promotes the goal of forcing a peculiar and unique development on the Russian people.

The inward-turning attitude of the people is fostered not only by the policies of the regime but also by geography. The vast plains of central Russia have always been an object of awe and pride to this people. The harsh climate and few roads in the great stretches of plain caused men to gather in tight, lonely communities. Survival was for the hardy and for those who learned that their only hope lay in the physical warmth and social protection offered by the group. An individual counted for nothing against the limitless and formless plain. Yet those who survived reveled in the breadth of the land they occupied, and Russians continue even today to call themselves a "broad" people.

The land and the immutable forces of nature which acted upon the land were treated as sacred long before the introduction of Christianity. This pagan belief was syncretized with Christianity. For the mass of the people, God, the motherland, and the tsar became a triumvirate of powers, all of whom would come to the aid of the individual if they could be reached through the proper channels and by the use of the right form of

appeal. Reverence for the motherland was effectively used by the regime during World War II, when political, specifically Soviet appeals did not meet with the desired response. The inviolability of the motherland has been a source of strength for any regime seeking to defend Russia against invasion.

The primary units of allegiance in prerevolutionary Russia, apart from the country and the tsar, were the household unit and the communal village, or *mir*. The household was headed by a patriarch whose rule was absolute. The village elder was responsible for the periodic redistribution of the land, which was allotted to the household units on a basis of need. The elder's power derived from the community. Leadership was not sought; it was considered a burden. All decisions were made unanimously, on the basis of consensus without a vote, and once reached they had the moral force of law and an aura of sanctity. Since making decisions depended on the absence of open disagreement, there was tremendous social pressure upon individuals to go along with the group. No provision was made in the *mir* for a dissenting minority or a loyal opposition. The origins of the present-day Soviet stress on "mass participation" may be traced in part to the councils of the *mir*.

Lenin and the Bolsheviks sought to remake the Russian people according to the theories of Karl Marx, but Marx had envisaged the socialist revolution taking place in a society with a developed capitalist industrial economy. The main necessity in Lenin's plan for a direct transition to socialism, therefore, was industrial development. Indeed, the Bolsheviks displayed a simplistic faith in the liberating and rationalizing power of secular industrial society once it was rid of the "fetters" of private property. With this faith went a corresponding contempt for what Marx and Engels in the Communist Manifesto called the "idiocy of rural life." The peasant was to be recast in the mold of the urban worker. Rationality, science, and "progress," defined in material terms, were to replace the static and traditionalist bias of the peasant world with its reliance on magic and religion.

According to Marx, all social and cultural phenomena were seen as a "superstructure" dependent on and largely shaped by the economic base of society. The government itself, literature, the arts, science, the means of communication, morality, religion, and the family all were either products of this base or the servants of those who controlled the means of production. In conformity with this doctrine, all existing institutions would either disappear or have to be radically changed as the economic base itself changed from a system of capitalist exploitation to one of control by the proletariat.

As interpreted by Lenin, revolutionary Marxism held the promise of a paradise on earth. The new regime, as the precursor of a worldwide proletarian revolution, was "in step with history" and would lead the Soviet people to new greatness. Once the society was fully industrialized and all vestiges of capitalism were

destroyed, the people would take over the going industrial plant, and as there would no longer be a need for repressive political controls, the state itself would "wither away." A classless society would emerge, operating under the slogan "From each according to his ability, to each according to his needs."

The planning that became an essential part of the scheme of things after 1928 followed a period of much trial and error. Centralization of production inevitably brought into being a complex bureaucratic machinery. Rapid industrialization required broad integration of the economy and forced sacrifices on the part of the masses, who were considered not yet able or willing to think in terms of ultimate, common goals. Support of the new order was not universal and spontaneous, however, and resistance was not limited just to those who had been "in control of the means of production." Even "backward elements" among the industrial workers resisted. The real masses, the peasantry, were left relatively free at first, but as a result of the forced collectivization drive initiated by the First Five Year Plan they found themselves being reduced to a state as miserable as that from which they had begun to emerge.

Proceeding on the premise that its program must be pushed, whatever the resistance and the human toll, the regime developed an extensive police system to eliminate any possible disaffection or subversion. The political police enjoyed arbitrary and extralegal powers of arrest and conviction and thus became a source of terror for the majority of the people, despite the people's traditional acceptance of strong central authority. However, a society governed solely through the use of capriciously applied force cannot function. In order to function, the Soviet regime has found it necessary to use a number of devices to provide a sense of legality and order. The introduction of highly developed techniques of mass participation, material and social incentives, and the resurrection of some traditional institutions have all been called upon to accomplish this end.

Mass participation consists chiefly of constant social pressure on the masses for industrial and agricultural production and positive support of the policies of the leadership. The withholding of approval—the failure of consensus being manifested by apathy—is taken as a sign of hostility. Mass participation, combined with tight control of all communications media and the threat of extralegal government action, actually operates to isolate the individual. In Soviet society, the individual is rarely detached enough to look beneath the surface of this phenomenon—which amounts to mass acceptance—and to perceive that others feel as he does, perhaps resentful of the regime or of its policy, but afraid to voice such opposition. Mass participation thus promotes a collective ignorance and passivity which serves some of the purposes of the regime.

Concurrently the regime has developed a series of incentives, both material and honorific, as a positive means of motivating the population to produce at the pace demanded by the economic planners. With the establishment of a system of differential incentives

"according to work," the basis was laid for a class system that bears many resemblances to that of any other highly industrialized society. This has occurred despite official avowals that the society consists of only two classes, the workers and the peasants, united by common interests. In practice Soviet society could not function without the existence of a third group, which the regime refuses to set off as a separate "class." This "stratum," known as the intelligentsia, consists of the bureaucrats, professionals, factory managers, white-collar workers, and artists, as well as the functionaries who actually control the destinies of the nation. Superimposed upon the class structure is the Communist Party. It is primarily through membership in or approval of the party that an individual can achieve economic and social mobility. The egalitarian ideal, widely proclaimed at the time of the revolution, has receded into a very distant future.

In its attempt to sweep away the institutions of the past, the regime found it had swept away many of the stabilizing forces of life formerly provided by religion, the family, and other prerevolutionary forms. By 1936 there was a "retreat" toward social stabilization. The family was resurrected as a key institution of Soviet society, divorce was made more difficult, and abortion illegal. Family loyalty was not to override loyalty to the state, but was to promote such loyalty as well as obedience to the rules of Communist society. As a traditional symbol and rallying point of the Russian nation, the Orthodox Church performed yeoman service in World War II, and the regime found it expedient to bring the church under its control rather than destroy it. The "vestigial, superstitious" remains of religion continue to be tolerated as long as they do not restrict the party's main objectives or become a center of power independent of the regime.

A distinction is necessary in any discussion of Soviet policies between those relating to the predominant Russian people and those relating to the great number of ethnic minorities within the U.S.S.R. In the days of the Russian Empire there was no specific "nationalities policy," and over the centuries the treatment of ethnic minorities alternated between periods of attempted Russification and comparative neglect. When the Bolsheviks took power in 1917, resolution of the nationalities question within the former empire posed a painful choice. On the one hand, proclamation of equal rights for minorities could be important in enlisting the sympathy and support of non-Russian groups. On the other, the Bolsheviks were dedicated to an internationalism which regarded struggles for national independence as relics of bourgeois ideology. After considerable intraparty debate, the principle of "self-determination" was proclaimed, but with the important proviso that autonomy should be reserved for workers and peasants—and consequently dominated and controlled by the Communist Party, which considered itself the spokesman of these groups. Stalin, whose special concern at that time was the minority problem, further prescribed that minority expression be "socialist in content and national in form."

Initially events raced ahead of the Communist Party's decisions, and minorities such as the Finns, Baltic peoples, and Georgians succeeded in breaking away from the collapsing Russian Empire. As for those minorities which remained under Moscow's control, the newly established tolerance succeeded in evoking gratitude and loyalty toward the regime, but at the same time it awakened a greater degree of national consciousness than the regime had bargained for. The traditional literatures of the minority peoples often recorded exploits of national heroes who had fought the encroaching Russians, and the expanding intelligentsia of some groups, even while they accepted the tenets of Marxism, sought the development of socialism within their own cultural pattern and chafed under "guidance" from Moscow. Although "Great Russian chauvinism" was condemned in the 1920's by the highest party authorities, it was inevitable that the preponderance of Russians in the party and the U.S.S.R. as a whole would lead to a patronizing "big brother" attitude by Russians toward the minorities.

Through the 1930's many minority leaders were purged and Russians increasingly placed in positions of power. Criticism of "Great Russian chauvinism" disappeared, as Sovietization moved forward hand in hand with Russian hegemony. Although this did little to restore the good will of the alienated minority peoples, Communist techniques of power had developed sufficiently to prevent coordinated resistance. Industrial expansion and economic development led to a constant influx of Russians into the minority areas; in some areas they actually outnumbered the native population. The Russians, usually concentrated in the cities, felt no need to learn the local language; Russian schools were established on a wide scale. In fact, ambitious parents within the minority groups, seeing the advantages of a thorough Russian training for their children, came to place little value on preserving their own "backward" culture. Except for the Russianized few who made common cause with the rulers, the natives' resentment against the ruling group was nourished by Russian political and economic domination, plus Russian arrogance toward the technologically backward native population—and the consequent disruption of the traditional pattern of life.

The German invasion of the U.S.S.R. in 1941 made necessary a quick assessment of the reliability of the ethnic minorities. Large numbers of them welcomed the invaders with open arms, and, as the war proceeded, several smaller nationalities were exiled to the east and their autonomous administrative units were eliminated. After the war many new aspects of the nationality problem presented themselves. The policies and behavior of the invading Germans had done much to convince the minorities that there were worse fates than Sovietization. The addition of new territories to the U.S.S.R. brought into the country many people who had never lived under the Soviet Government, however, and these were subject to intensive pressure from the regime to conform to the national pattern. Those who resisted—

and there were many—were executed or exiled, and to insure the regime's hold on these areas, large cadres of Russians were settled in key locations.

Except with regard to the newly acquired territories and to the peoples "liquidated" in connection with World War II, Soviet policy toward minorities has shown few marked changes from that of the 1930's. Russian is increasingly the overall language, and Russians continue to hold key posts throughout the U.S.S.R. and to spread out as settlers, engineers, and industrialists into all corners of the land. Even the Russian Orthodox Church enjoys a preferred status among the religions of the U.S.S.R. Minority languages, literature, and arts are still supported and even encouraged, but any minority movement that could conceivably foster separatist sentiments is quickly and ruthlessly suppressed.

To most Russians the government is, as it has always been, something remote but inevitable; its representatives are to be appeased and avoided, although this is increasingly difficult to do. The all-pervasiveness of government, coupled with the number of areas of life in which arbitrary authority may be applied, comes into conflict with age-old values. An ambivalence permeates the Russian attitude. The people find much that is familiar in the institutions and functioning of the government, and they value many of the changes that have occurred, such as the welfare programs and the vastly increased educational opportunities. But the low standard of living has been a source of disillusionment, as well as anxiety and hardship. There seems at present, however, to be a conviction, not without some foundation, that the material conditions of life are improving. And, whatever the Russians may feel about their government, they are passionately loyal to the Russian land and proud of their nation's present position in world affairs.

The minority nationalities, which constitute approximately half of the total population, however, seldom share these patriotic sentiments. The Soviet nationalities policy has involved many inconsistencies, as well as much brutality. For the most part it has failed to win the minorities' loyal and enthusiastic support for the regime, but it has resulted in the emergence of a Russianized and Sovietized elite among them. Thus the potential leaders, passing through the Soviet educational system and lured by the economic and social advantages which conformity offers, are continually siphoned off, leaving the masses leaderless and their resentment inarticulate and ineffective.

The demands of industrial society for a certain order and predictability in life, as well as the emergence of an established upper class with a vested interest in the system and in the maintenance of its own favored position, have tended to push the regime away from punitive, terroristic, and negative controls in favor of incentives, exhortation, and orderly though powerful legal processes. The interrelationship between rule by intimidation and more stable and legal methods is a continual problem for the regime; alteration in

emphasis rather than a complete and permanent shift to one or the other is characteristic of the regime's rule today.

B. Population

1. Size and geographic distribution

According to the census of 15 January 1970, the population of the U.S.S.R. was 241,720,000,* up almost 16% from the 1959 figure of 208,827,000. The U.S. Bureau of the Census projection for 1 January 1971 was just over 244 million. In terms of total population the Soviet Union is the third largest country in the world, ranking behind China and India and ahead of the United States. Figure 47 provides a comparison of the known and estimated populations of the U.S.S.R. and the United States from 1960 to 1990. Despite its large population, the Soviet Union's continental-scale land area provides it with an overall population density of only 28 persons per square mile, one of the lowest in the world (Figure 48).

Vast tracts of land east of the Urals, extending through Soviet Central Asia and Siberia to the Far East, remain uncongenial to human habitation. It follows that population distribution varies widely among administrative regions, from less than one person per square mile in the Yakutskaya Autonomous Republic and Magadan region of northeast Siberia in the Russian

*The population figures in 4. Sociological are for the most part based on the 1970 Soviet census, details of which became available as this General Survey was in the final stages of processing; other sections may still on occasion reflect 1959 census figures.

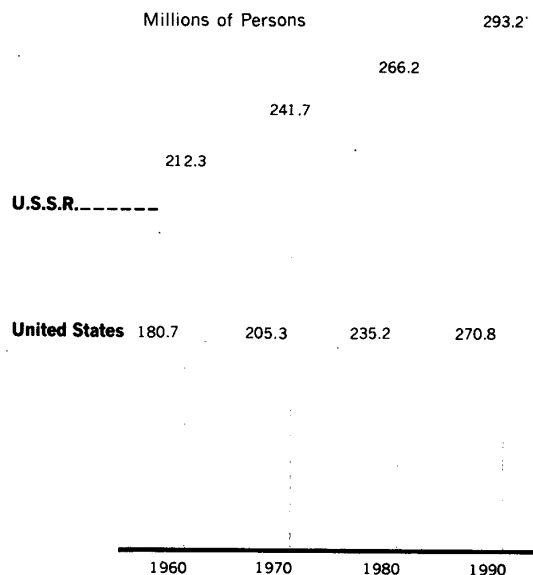


FIGURE 47. Total population in millions, the U.S.S.R. and the United States, 1960-90 (U/OU)

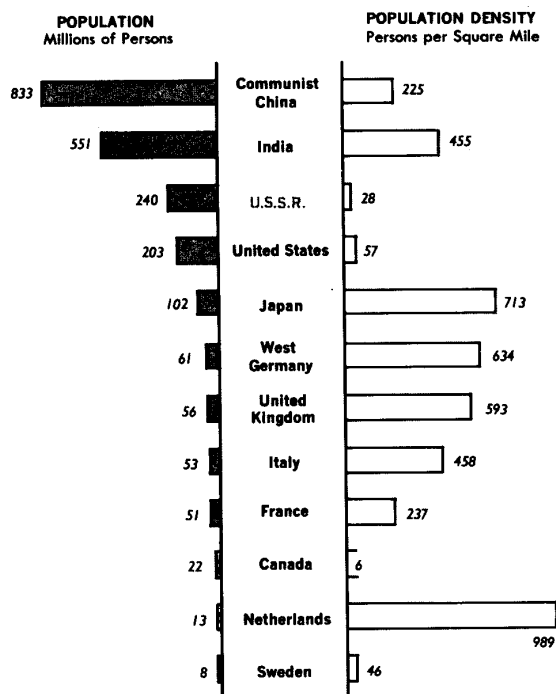


FIGURE 48. Population and population density, the U.S.S.R. and selected countries, 1969

Republic (R.S.F.S.R.) to 480 per square mile in the Donetsk region of the Ukraine. The average density of the European part of the U.S.S.R. is 84 persons per square mile. The distribution of the total population of the Soviet Union by constituent republic according to the 1959 and 1970 censuses, including urban proportion and growth rates, is outlined in Figure 49. As may be seen from this figure, the greatest increases in growth have occurred in the non-Russian areas of the Caucasus and Central Asia, not only because of the higher birth rate in these less-Europeanized areas but also because of the great influx of Russian migrants from the northern and central parts of the R.S.F.S.R.

At the same time, all of the Soviet Union continues to experience a heavy movement of population away from the countryside as the expansion of Soviet industry attracts surplus rural population to existing urban centers or creates new ones, such as Bratsk and Tol'yatti. The tempo of urban growth may be seen in

the results of the 1970 census, which officially established that the U.S.S.R.'s population has become predominantly urban. Of the 36 million new urban residents in 1970, 15 million were created by urban family natural growth, 16 million were due to rural-urban migration, and 5 million were made urban by the reclassification as urban of previously rural settlements. Comparison with previous censuses is shown in Figure 50. In 1970 the Soviet Union's 10 largest cities were (population in thousands):

Moscow	7,061	Khar'kov	1,223
Leningrad	3,950	Gor'kiy	1,170
Kiyev	1,632	Novosibirsk	1,161
Tashkent	1,385	Kuybyshev	1,047
Baku	1,261	Sverdlovsk	1,026

2. Composition

With its nearly 170 nationalities and about as many languages, the Soviet Union stands as the last major representative of classic Western imperialism. Under its banners live some groups with cultures akin to Scandinavia and north Germany, others scarcely distinguishable from Turks and Afghans, and still others who follow a way of life identical to that of the Eskimo. Most of these ethnic groupings are quite small, however, and with the passage of time many will probably be assimilated into related larger nationalities or Russified. In the 1959 census, nationality and language groups comprising more than 10,000 persons were distributed as follows:

	NATIONALITIES 1959	(1970)	LANGUAGES 1959
More than 1,000,000	19	(22)	16
100,000-1,000,000	28	(28)	28
10,000-100,000	28*	(27)	27

*Chinese and Veps nationalities, listed in 1959, de25X1 in 1970.

The largest single nationality is the Russian, with 129,015,000 persons in 1970, or 53.4% of the total population that year. By virtue of their role as "elder brothers" to the other nationalities, the Russians have exerted a powerful cultural influence throughout the Soviet Union and have thereby attracted 13,000,000 non-Russians into the ranks of Russian speakers. Most of these are Ukrainians, Jews, and Belorussians. Those speaking Russian as their principal language constituted 58.7% of the total population in 1970.

As the non-Russian component of the Soviet Union's population has tended to expand more rapidly than the Russian, the latter's share of the total population may eventually drop to below 50%. Aware of this, the Soviet leadership has begun to stress the common heritage and common future role of the Russians and their closely related East Slavic "brothers," the Ukrainians and the Belorussians. These three peoples together made up 74% of the total population in 1970. The Ukrainians and Belorussians continue to insist on their unique

25X1

FIGURE 49. POPULATION OF UNION REPUBLICS, 1959 AND 1970

	POPULATION		PERCENT INCREASE	PERSONS PER SQUARE MILE		PERCENT URBAN	
	1959	1970	1959-70	1959	1970	1959	1970
--- Thousands ---							
R.S.F.S.R.	117,534	130,079	11	17.8	19.7	52	62
Ukraine	41,869	47,126	13	180.5	203.2	46	55
Belorussia	8,056	9,002	12	100.4	112.3	31	43
Lithuania	2,711	3,128	15	107.6	124.2	39	50
Latvia	2,093	2,364	13	85.1	96.1	56	62
Estonia	1,197	1,356	13	68.8	78.0	56	65
Moldavia	2,885	3,569	24	221.9	274.8	22	32
Georgia	4,044	4,686	16	150.3	174.3	42	48
Azerbaijan	3,698	5,117	38	110.7	153.0	48	50
Armenia	1,763	2,492	41	153.3	216.8	50	59
Kazakhstan	9,153	12,849	40	8.7	12.3	44	51
Turkmeniya	1,516	2,159	42	8.0	11.4	46	48
Uzbekistan	8,261	11,960	45	47.6	68.9	33	36
Kirgiziya	2,066	2,933	42	27.0	38.3	34	37
Tadzhikistan	1,981	2,900	46	35.8	52.4	33	37
Total U.S.S.R.	208,827	241,720	16	24.1	27.9	48	56

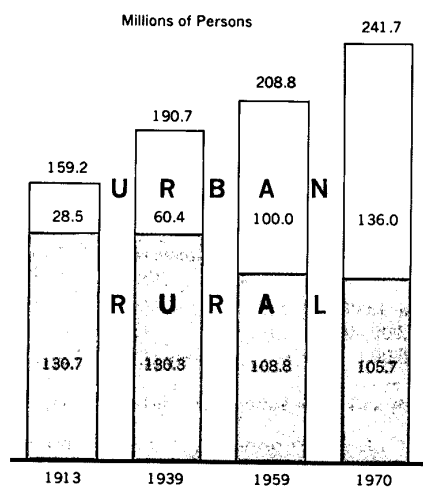


FIGURE 50. Urban and rural population in selected years from 1913 to 1970

national characteristics, but to most non-Slavic Soviet peoples the lines separating the East Slavic nationalities from the Russian are more distinctions than differences.

3. Structure

The Soviet population structure sharply reflects the heavy losses in World War II, and to a lesser extent it continues to show the effects of both the disruption experienced in the 1930's and the losses suffered from 1914 to 1921. These losses, combined with the normally lower mortality rates for women, have led to a disproportionate share of women in the total population, particularly in the age groups above 45. According to the 1970 census, however, the past 25 years

of peace are reducing the disproportion, as may be seen by the percentages in the following tabulation:

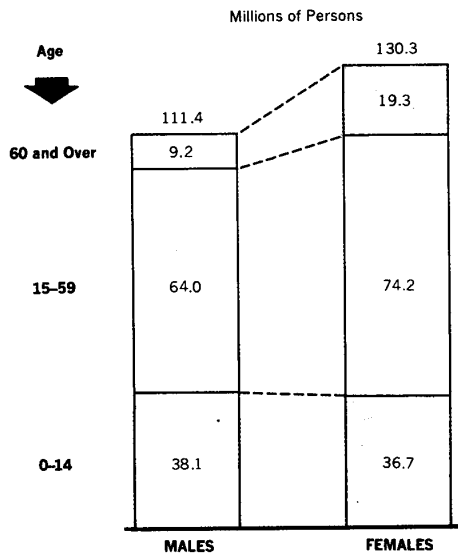
	MALES	FEMALES
1913	49.7	50.3
1940	47.9	52.1
1950	43.9	56.1
1960	45.2	54.8
1970	46.1	53.9

Even if there are no manmade or natural disasters from 1970 to the end of the century, the sex ratio by 1990 (47.6% males) will only approximate the 1940 ratio, and it will be well into the 21st century before the 1913 ratio is reached, again provided there is uninterrupted peace and prosperity. The continuing imbalance in the sexes has had wide social and economic repercussions, particularly with respect to the major role assigned women in the labor force.

In terms of relative age, the Soviet population can still be classed as youthful. In 1970, 30.9% of the total consisted of persons age 15 and younger, while only 11.8% were 60 and older. Again reflecting losses in World War II as well as the higher natural mortality rate among men, the male population has a markedly higher proportion of younger members than does the female population. Figure 51 compares the Soviet male and female population by number and percent in 1970. With the restoration of age classes decimated by war, as well as with the advance in life expectancy, the Soviet Union is beginning to experience relative aging. Thus, in 1950 the median age was 24.4 years; in 1960, 26.8 years; and in 1970, 29.8 years. By 1990 it is estimated that the median age will be 32.2. Figure 52 compares the estimated age-sex structure in the Soviet Union in 1970 with the projected structure in 1990.

By way of comparison, the United States shows a more balanced population profile, with the male share of the population dropping from 51.5% of the total in

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NOTE: Totals may not add due to rounding

FIGURE 51. Estimated age-sex distribution, 1970

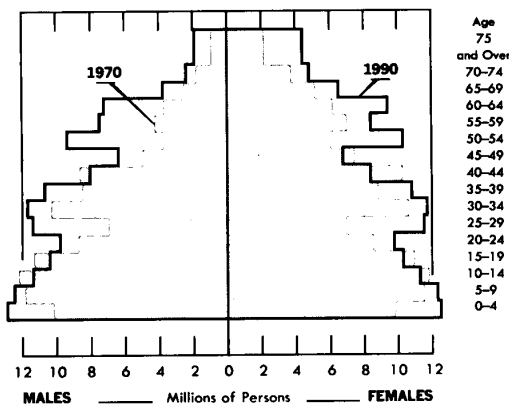
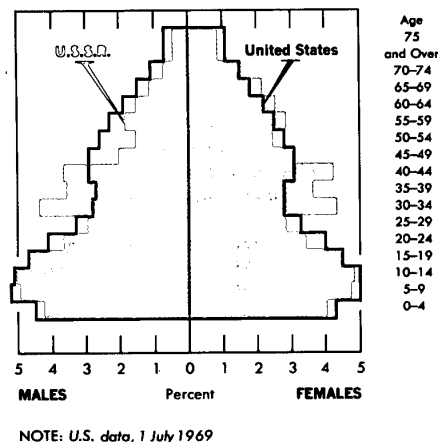


FIGURE 52. Comparison of age and sex structure, 1970 and 1990

1910 to 49.3% in 1960, with every likelihood that the decline will continue, though at a more moderate pace, into the next century, barring, of course, wars or natural disasters. The U.S. age structure also contrasts with the Soviet, having shown signs of relative aging to 1950, when a median age of 30.2 years was reached, and then growing younger, with the 1968 median age dropping to 27.8. The U.S. and Soviet age and sex structures for 1970 are compared in Figure 53.

4. Dynamics

Preliminary results of the 1970 Soviet census reveal that population growth during the 1960's declined to about 1.3% annually, compared with an annual rate of 1.7% during the 1950's. Lower birth rates have largely been responsible for the slowdown in population



NOTE: U.S. data, 1 July 1969

FIGURE 53. Comparison of age and sex structure, the U.S.S.R. and the United States, 1970

growth. The rate drop has resulted from increased urbanization, high employment among women, housing shortages, the desire for a higher standard of living, the fact that fewer women have entered the childbearing ages since 1960 than in the previous decade. Marriage, divorce, birth, death, and infant mortality rates in the Soviet Union during the decade 1960-69 are shown in Figure 54, with a comparison with the United States for 1969.

The slow decline and more recent relative stabilization of the marriage rate also reflects the decline in the number of marriageable young people. The only available data on the marital status of the Soviet people are the percentage of men and women in the various age groups who were married at the time of the 1970 census. That census indicated that 72.2% of the men and 57.9% of the women who were 16 and over were married. The proportion of married men rose with each successively higher age group to a peak of 95.2% at ages 45 to 54 and then declined to 77.8% at ages 70 and over. The proportion of married women, on the other hand, reached a peak of only 85.3% at ages 30 to 34 and fell below 50% in all age groups above 59. The small proportion of married women at the higher ages is attributable mainly to the loss of men in wars or civil conflict. In 1966 the median age at first marriage was 26.6 years for grooms and 23.7 for brides in the U.S.S.R., compared with 22.8 and 20.5 years, respectively, in the United States.

Changes in the Soviet divorce rate have reflected the varying government policies toward the family. Thus, divorces were quite easily obtained in the immediate postrevolutionary period, as the family was considered an institution bound to wither away under socialism. This policy was revised sharply in 1936 and then drastically in 1944, when the government placed a series of legal barriers in the divorce procedure in order to shore up the family which had been badly undermined

FIGURE 54. VITAL RATES PER 1,000 POPULATION, 1960-69

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	U.S. 1969
Marriages.....	12.1	11.0	10.0	9.1	8.5	8.7	8.9	9.0	8.9	9.4	10.6
Divorces.....	1.3	1.3	1.3	1.3	1.5	1.6	2.8	2.7	2.7	2.6	3.3
Births.....	24.9	23.8	22.4	21.1	19.5	18.4	18.2	17.3	17.2	17.0	17.7
Deaths.....	7.1	7.2	7.5	7.2	6.9	7.3	7.3	7.6	7.7	8.1	9.5
Infant deaths*	35.0	32.6	32.7	31.3	29.4	27.6	26.1	26.3	26.5	26.5	20.7

*Deaths of infants under 1 year of age per 1,000 live births.

by the successive shocks of agricultural collectivization, speeded-up industrialization, and war. In response to frequently voiced popular dissatisfaction over the rigidity of these laws, the government decided in 1965 to ease the obstacles to divorce, and the change was reflected by a 75% increase in the divorce rate.

Since 1917 Soviet birth and death rates have declined in response to urbanization, industrialization, and rising levels of education and public health, but the downward trend has been subject to sharp fluctuations. War, civil strife, epidemics, and famine have had a severe impact on fertility and mortality on several occasions. Unfortunately the levels of fertility and mortality during such periods are mostly a matter of conjecture because of incomplete Soviet statistical reporting. The following tabulation shows the general trend by 13-year intervals:

	BIRTHS	DEATHS	NATURAL INCREASE	INFANT DEATHS PER 1,000 LIVE BIRTHS
--- Per 1,000 population ---				
1913	45.5	29.1	16.4	269
1926	44.0	20.3	23.7	174
1939	36.5	17.3	19.2	167
1952	26.5	9.4	17.1	75
1965	18.4	7.3	11.1	27.6

The birth rate in the U.S.S.R. has declined to a point where it corresponds very closely to the European average and is similar to those of such large West European nations as Italy, the United Kingdom, West Germany, and France. However, it is still significantly higher than the rates reported by most East European countries. Within the U.S.S.R. the level of fertility tends to be substantially higher in rural communities than in cities and towns, and even higher in the Asiatic republics than in the European ones. The birth rates in the different republics of this ethnically and culturally diverse nation range from levels that are almost as high as those of the economically less developed countries of Asia to levels that are among the lowest in the world. Figure 55 summarizes the birth and death rates for the 15 republics in 1969.

Death rates in the Soviet Union are significantly lower than those in the United States and most European countries. This can be explained in large measure by the fact that the U.S.S.R.'s population includes a comparatively small proportion of older people, especially of males over 45. Soviet death rates

FIGURE 55. VITAL RATES PER 1,000 POPULATION, BY UNION REPUBLIC, 1969

	BIRTHS	DEATHS	NATURAL INCREASE
U.S.S.R.....	17.0	8.1	8.9
R.S.F.S.R.....	14.2	8.5	5.7
Ukraine.....	14.6	8.6	6.0
Belorussia.....	15.9	7.4	8.5
Lithuania.....	17.4	8.7	8.7
Latvia.....	14.0	11.1	2.9
Estonia.....	15.5	11.3	4.2
Moldavia.....	18.9	7.4	11.5
Georgia.....	18.7	7.5	11.2
Azerbaijan.....	29.3	7.0	22.3
Armenia.....	22.8	5.2	17.6
Kazakhstan.....	23.5	6.2	17.3
Turkmeniya.....	34.3	7.0	27.3
Uzbekistan.....	32.7	5.9	26.8
Kirgiziya.....	30.1	7.5	22.6
Tadzhikistan.....	34.7	6.1	28.6

are substantially higher than the U.S. rates for most age groups below 50 among males and below 40 among females. At the higher ages, the Soviet rates are lower than the U.S. rates, and at age 75 and over the Soviet rates are extremely low, even in comparison with those of the Netherlands and the Scandinavian countries, where levels of mortality are among the lowest in the world.

The U.S.S.R. has made remarkable progress in the reduction of infant mortality. According to Soviet statistics the number of deaths of infants under 1 year of age per 1,000 live births in 1969 was approximately one-tenth the number in 1913. In that infant mortality rates are a fairly sensitive indicator of the adequacy of general medical and public health levels, it can be concluded that, despite dramatic improvement, the Soviet Union continues to lag behind the United States and other developed countries, as seen in the following tabulation of numbers of infant deaths per 1,000 live births for 1968:

Sweden	12.9*	United States	21.7
Japan	14.9*	West Germany	22.8
United Kingdom	18.8	U.S.S.R.	26.5
France	20.4	Italy	32.2
East Germany	20.4	Poland	33.4
Canada	20.8	Yugoslavia	57.9

*1967.

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Declining mortality has also been reflected in the significant increase in the longevity of the Soviet people. An average life expectancy of only 32 was reported for the European Russian during the 1896-97 period, but 1968-69 statistics show that the average for the entire country had reached 70 years. The following tabulation gives the life expectancy figure in the 1960's for selected countries:

	MALES	FEMALES
Sweden (1967)	71.9	76.5
United Kingdom (1965-67)	68.7	74.9
Japan (1967)	68.9	74.2
France (1966)	68.2	75.4
East Germany (1967)	68	73
West Germany (1965-67)	67.6	73.6
Poland (1965-66)	66.9	72.8
United States (1967)	67.0	74.2
Italy (1960-62)	67.2	72.3
U.S.S.R. (1968-69)	65	74
Yugoslavia (1961-62)	62.4	65.6

The future rate of growth of the population will be determined primarily by the present population structure and future trends in mortality and fertility, barring any change in the government's tight restrictions on emigration and immigration. The first of these factors, the present population structure, will be conducive to a slight rise in the rate of population growth when the larger cohorts of women born after 1949 enter the principal childbearing ages. The age structure is expected to continue favorable to a higher birth rate until the early 1980's, when the number of women entering the most important reproductive ages will again begin to fall as a result of the decline in the birth rate since 1960. The present age structure also indicates that, unless there is a very sharp rise in the average number of births per woman, the proportion of older people in the population can be expected to increase significantly during the 1970's and 1980's. Such an increase by itself would tend to raise the death rate, thus reducing the rate of population growth.

Since future reduction in mortality through public health measures and scientific advances will largely be canceled out by the steady aging of the population, total growth will increasingly depend on changes in fertility. The level of fertility, as measured by the gross reproduction rate, declined by 14% between 1960 and 1968 to a level 14% lower than that of the United States, placing it among the lowest in the world. Future trends in fertility cannot be predicted with confidence, however, for they can be very responsive to changes in economic and social conditions and governmental policies.

5. Problems and policies

The most pressing population problems of the Soviet period have resulted from war losses, especially from those of World War II. At the end of that war, there were 25 million fewer men than women, with the sex ratio amounting to only about 60 males per 100 females at age 20 and over. Such a huge loss of men has had a tremendous impact on manpower resources and has

necessitated a remarkably high level of female participation in the labor force. Furthermore, the depressed fertility and increased infant and child mortality of World War II and the immediate postwar years greatly reduced the number of young people reaching working age during the late 1950's and early 1960's. The extremely small size of the cohorts born during the 1940's is expected to continue to depress the total number of persons in the working ages well into the next century, but with the larger cohorts born after 1949 now entering the 16-19 age group, the number of entrants to the labor force can be expected to increase significantly. With the passing of time, the shortage of men may be expected to become less of a problem. When World War II ended, the abnormally large deficit of men affected all of the adult age groups, but by 1970 it affected only ages 45 and over, and by 1990 it is expected to affect only those beyond retirement age (65 and over).

Official policies affecting the birth rate appear to have followed a laissez-faire attitude during most of the Soviet period. Although Lenin believed that rapid population growth was a source of strength to a socialist state, he advocated the legalization of abortion and the availability of contraceptives, contending that it was a basic right of the individual citizen to decide whether or not a child should be born. In 1920 the government abolished the prerevolutionary laws equating abortion with murder and legalized abortions, provided they were performed free of charge by physicians in hospitals. By the mid-1930's, however, the abortion rate had reached such alarming proportions that progressively stricter policies were adopted, and in 1936 abortions were forbidden except for medical and eugenic reasons. The government continued to follow this policy until 1955, when virtually all restrictions were once again removed from abortions performed by physicians within 12 weeks after conception.

Soviet authorities presented the changes in the abortion regulations in both 1936 and 1955 as measures to protect the health of the population rather than as measures to influence the level of the birth rate. In view of the conditions prevailing during these two periods, there probably was considerable justification for concern about the health of Soviet women. The extremely high abortion rate during the mid-1930's indicates that many women were having one abortion after another, and many of the very high number of illegal abortions during the mid-1950's were being performed under unfavorable medical conditions by untrained or poorly trained practitioners. Soviet authorities have adopted no significant new restrictions since the abortion regulations were liberalized in 1955, but it is apparent that they would prefer to see further reductions in the number of such operations. Because abortions tie up medical personnel and hospital facilities and result in considerable absenteeism among working women, the authorities have resorted to campaigns encouraging contraception as an alternative, arguing that it is preferable to abortion on medical

grounds. Soviet health officials have had difficulty in perfecting reliable mechanical means of contraception and have tended to place greater reliance on birth control pills.

The Soviet Union adopted a modest program of family allowances at the time abortions were outlawed in 1936. This program appears to have been a welfare measure designed to ease the financial burdens only for couples with very large families, for its grants did not begin until the birth of the seventh child. In 1944 a decree established both a series of medals to be awarded to women with large numbers of children and a system of family allowances in an obvious effort to raise the war-depressed birth rate. Under this system significant benefits began with the third child, and the benefits for each subsequent child rose progressively higher until after the birth of the 11th child. The 1944 decree continues to serve as the basis for the family allowance program, although in 1947 the benefits were cut in half. This sharp cut, together with the rise in wages, has greatly reduced the significance of the family allowance program as an incentive to childbearing, and it is unlikely that the allowances now encourage many couples to have more children than they would otherwise have had.

Since the family allowance benefits were cut in 1947, the Soviet Union has not pursued a clear-cut policy of either encouraging or discouraging childbearing. Government programs and practices which tend to encourage childbearing coexist with those which tend to discourage it. Although probably not by design, the practices which are likely to depress the birth rate appear to be more numerous, and many of the programs which may be construed as pronatalist, such as the family allowance system, are not very effective. In recent years Soviet newspapers and professional journals have reflected considerable concern over the decline in the birth rate, especially in the urban areas of the European portion of the country. Thus far, however, there is no evidence that the Soviet leadership has become sufficiently concerned to consider the adoption of any strong pronatalist measures.

From a long-range point of view, the Soviet authorities would probably like to see a higher birth rate now in order to insure a more abundant labor reserve in the future. They are constantly reminded that the recent tight labor supply resulted principally from the low birth rate of the 1940's. On the other hand, a substantial rise in the birth rate would have several more immediate consequences that could prove somewhat burdensome. More women would have to leave the labor force to bear and raise children, and larger investments would have to be made in child care, educational facilities, housing construction, and production of consumer goods.

Soviet authorities have been unable to provide adequate manpower for many of their ambitious economic development programs in the more remote northern and eastern regions of the country. Since the First Five Year Plan began in 1928, millions of migrants

have been attracted to these areas by appeals to patriotism and by incentives such as higher wages, tax exemptions, new housing accommodations, and travel expenses for workers and their families. After the abolition in 1956 of criminal penalties for quitting jobs without authorization, however, it soon became clear that, although large numbers of people were continuing to move to the less populated areas of Siberia and Central Asia, many were leaving after staying for relatively brief periods. As a result, some parts of Siberia have become areas of net out-migration, and many of the other more remote areas, although still having net balances of in-migration, have also been experiencing labor shortages and high levels of labor turnover.

Soviet officials have attempted to solve the problem of retaining workers in these areas by offering higher wages and other monetary benefits, but these incentives have often been offset to a large extent by higher living costs. Furthermore, the problem can probably be attributed mainly to the fact that the amenities of life and climatic conditions are generally far less attractive in such underdeveloped areas than in the principal areas of settlement in the western portion of the country. As Khrushchev noted in 1959, workers are likely to continue leaving the northern and eastern regions until overall living conditions are greatly improved.

Providing a fillip to overall Soviet movement since World War II have been such phenomena as the reduction in the number of persons detained in concentration camps or sentenced to permanent exile; the rehabilitation of seven small nationalities deported during World War II to Siberia and Central Asia, with permission granted to five of these to return to their homelands; the promotion of massive agricultural settlement in the "virgin lands" of northern Kazakhstan and adjacent Siberia; the granting of refuge to Kazakh-related peoples fleeing the excesses of China's Cultural Revolution, and the ingathering of the Armenian diaspora, both from other parts of the U.S.S.R. and from abroad, to the Armenian Soviet Republic. Similar efforts have been made since World War II to attract persons of Russian, Ukrainian, Belorussian, and Baltic origin living outside the Soviet Union, but they have not met with a success anywhere comparable to that of the Armenian campaign.

At the same time, emigration is the subject of state-to-state agreements such as those with Poland after World War II and in the late 1950's allowing the exit of Poles and Jews who held Polish citizenship in 1939 in exchange for ethnic Ukrainians, Belorussians, Russians, and Lithuanians, or that with Czechoslovakia after World War II exchanging ethnic Czechs and Slovaks for ethnic Russians and Ukrainians. There also exists a very small-scale program allowing the reunion of families separated by World War II. Under this program a trickle of ethnic Germans, ethnic Greeks, and Jews, as well as a very few Russians, Ukrainians, and Balts, have left the U.S.S.R. For the great bulk of the citizenry, however, the possibility of emigration does not exist.

C. Structure and characteristics of the society

1. Ethnic and linguistic divisions

Diversity is the most striking feature of the ethnic and linguistic composition of the Soviet Union. Although the Russians comprise about half of the total population, and the three related Eastern Slavic peoples about three-fourths, relatively alien ethnic groups may occupy extensive land areas or smaller but strategically important places. There are six significant ethnic divisions—Indo-European (largely Slavic), Uralian (largely Finnic), Altaic (largely Turkic), Caucasian, Semitic, and Paleo-Asiatic—which can be broken down into more than 60 distinct groups. Most ethnic groups are small, at least in relation to the overall population of the vast Soviet empire. Only 11 have more than 1% of the total population, and only 6 more than 2%. The ethnic diversity of the U.S.S.R. is not a publicly stated matter of concern to the regime, since it is the official position that all groups in the state are equal and that none suffers any discrimination. The nationality and

language groups comprising more than 500,000 persons, as enumerated in the 1959 census, with com25X1: nationality figures for 1970, are listed in Figure 56.

The Russians, sometimes called Great Russians to distinguish them from the Little Russians (Ukrainians) and White Russians (Belorussians), are generally characterized by a fair to medium complexion, light to medium brown hair, and bluish or gray eyes. The average Russian is thickset and about 65 inches tall, with taller average heights noted in the south and west and shorter average heights in the north and east of the European part of the R.S.F.S.R., where there is a heavy admixture of Finnic peoples. Facial features are undistinguished, with thick lips, pug noses, and flat cheekbones quite usual. Almost 84% of the Russians enumerated in 1970 lived in the R.S.F.S.R., wherein they comprised 83% of that republic's population. They also comprised the largest nationality (43%) in Kazakhstan. In all the other republics the Russians ranked either second or third in the respective nationality standings; they comprised more than one-eighth of the total population in Latvia, Kirgiziya,

FIGURE 56. MAJOR NATIONALITIES AND LANGUAGES, 1959—1970

25X1

	NATIONALITY		LANGUAGE		NATIONALITY		LANGUAGE	
	1959	1970	1959		1959	1970	1959	
	<i>Thousands</i>				<i>Percent of distribution</i>			
Slavic grouping:								
Russian	114,114	129,015	124,119	54.6	53.4	59.4		
Ukrainian	37,253	40,753	33,225	17.8	16.9	15.9		
Belorussian	7,913	9,052	6,952	3.8	3.7	3.3		
Polish	1,380	1,167	642	0.7	0.5	0.3		
Baltic grouping:								
Lithuanian	2,326	2,665	2,287	1.1	1.1	1.1		
Latvian	1,400	1,430	1,360	0.7	0.6	0.6		
Other Indo-European:								
Armenian	2,787	3,559	2,510	1.3	1.5	1.2		
Moldavian*	2,321	2,817	2,218	1.1	1.2	1.1		
German	1,620	1,846	1,215	0.8	0.8	0.6		
Tajik	1,397	2,136	1,459	0.7	0.9	0.7		
Finnic grouping:								
Mordvin	1,285	1,263	1,004	0.6	0.5	0.5		
Estonian	989	1,007	953	0.5	0.4	0.5		
Udmurt	625	704	557	0.3	0.3	0.3		
Mari	504	599	480	0.2	0.2	0.2		
Turkic grouping:								
Uzbek	6,015	9,195	6,008	2.9	3.8	2.9		
Tatar**	4,968	5,931	4,946	2.4	2.5	2.4		
Kazakh	3,622	5,299	3,580	1.7	2.2	1.7		
Azerbaijani	2,940	4,380	2,918	1.4	1.8	1.4		
Chuvash	1,470	1,694	1,335	0.7	0.7	0.6		
Turkmen	1,002	1,525	997	0.5	0.6	0.5		
Bashkir	989	1,240	617	0.5	0.5	0.3		
Kirgiz	969	1,452	965	0.5	0.6	0.5		
Others:								
Georgian	2,692	3,245	2,765	1.3	1.3	1.3		
Jewish	2,268	2,151	***408	1.1	0.9	0.2		

*Includes persons classified as Romanian.

**Includes both Volga Tatars and Crimean Tatars.

***Yiddish only; other Jewish "national" languages in the U.S.S.R. are Georgian (36,000 Jewish speakers); Tajik (21,000 Jewish speakers); Tat (25,000 Jewish speakers); and Crimean Tatar (200 Jewish speakers). There are no statistics for Hebrew.

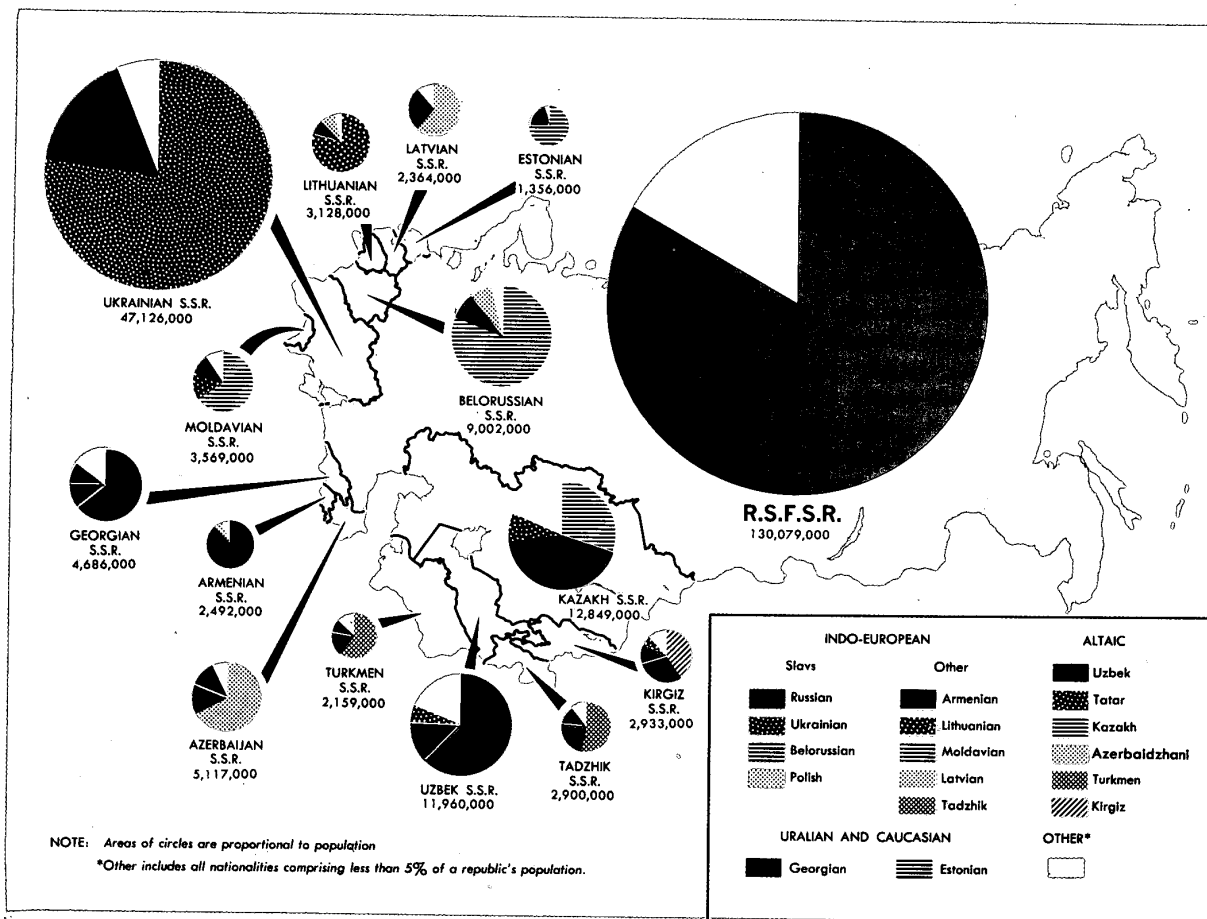


FIGURE 57. Population of the union republics by nationality, 1970

25X1

Estonia, the Ukraine, Turkmeniya, and Uzbekistan. Figure 57 shows the distribution of the nationalities in the 15 republics of the U.S.S.R. as of the 1970 census.

Most of the Russians who have migrated to traditionally non-Russian areas have gone to the cities, primarily as managerial, professional, and technical personnel or as trained industrial workers. In 1959 nearly three-fourths of the Russians who were living outside the R.S.F.S.R. were located in urban communities. In most non-Russian republics, Russians constituted a larger proportion of the people in the respective capital cities than in the other urban areas, reflecting the important administrative role Russians play throughout the U.S.S.R. Their position as the ruling nation is particularly pointed up in the Central Asian republics of Kazakhstan, Turkmeniya, Uzbekistan, Kirgiziya, and Tadzhikistan, where Russians in 1959 comprised more than 40% of the population of each of the capitals. In seven of the remaining nine non-Russian republic capitals, Russians in the same year comprised between one-fifth and two-fifths of the population. The two exceptions were Minsk in Belorussia and Yerevan in Armenia.

Although only 54.6% of the people counted in the 1959 census said they were of Russian nationality,

59.4% reported Russian as their principal language. The comparable figures for 1970 were 53.4% and 58.7%, respectively. The proportion of persons in the various non-Russian nationality groups who claimed Russian as their native language provides some measure of the extent to which they have been assimilated in the Russian-dominated Soviet society. Using this criterion, the Jews are by far the most Russified, since more than 76% of them considered Russian their mother tongue in 1959. Among the other non-Russian nationality groups with 100,000 or more members in 1959, those reporting more than 20% of their number as native Russian speakers included the Greeks, Karelians, Germans, Gypsies, Mordvins, and Koreans. Those reporting from 10% to 20% as native Russian speakers included the Bulgarians, Belorussians, Poles, Ukrainians, Komi, and Udmurts. In 1970 it was determined that 13 million non-Russians claimed Russian as their native language, in contrast to the 10.2 million counted in 1959, with another 41.9 million non-Russians claiming ability to speak Russian as a second language. Russian not only is the native language of the dominant majority; it is the official language of the U.S.S.R. at the national level, the language of communication between the various nationalities, the lingua franca of the cities throughout

most of the country, and the principal language of higher education. As a result, a knowledge of Russian is almost indispensable for political and economic advancement, and nearly all well-educated non-Russians speak the language fluently. In the predominantly non-Russian areas, a knowledge of Russian is facilitated by the official policy whereby instruction in the language is available to all non-Russian schoolchildren over the age of 8.

The other nationality groups are generally less widely distributed than the Russians. The Ukrainians, nearly 87% of whom lived in 1970 in their native republic, wherein they comprised 75% of the population, differ among themselves more markedly than do the Russians, but in general they can be said to be slightly taller and slightly darker than the latter. The Belorussians, 81% of whom lived in their native republic, where they made up 81% of the population, are a transitional group between the Russians and the Baltic peoples and are both taller and fairer than the Russians, with a strong tendency to blondness. More than three-fifths of the Ukrainians and nearly 55% of the Belorussians living outside their native republics in 1970 were reported to be residents of the R.S.F.S.R. The smaller nationalities in whose names union republics have been established tend to be even more heavily concentrated in one particular region, and generally form significant minorities in immediately adjacent non-Russian republics.

There are two partial exceptions to this rule. First, the Armenians are remarkably dispersed for a nationality granted union republic status. Whereas the other 14 such nationalities were listed in 1970 as having more than three-fourths of their members within their native republics, only 62% of the U.S.S.R.'s Armenians lived in Armenia, with an additional 26% divided nearly evenly between Georgia and Azerbaijan, 8% living in the R.S.F.S.R., and smaller numbers in all the other republics. Nevertheless, Armenia that year was far and away the most homogeneous republic in the Soviet Union, with 89% of its residents Armenian by nationality. The return home of Armenians in both the Soviet and non-Soviet diasporas has helped strengthen the homogeneity of the republic, while the generally high Armenian birth rate has cushioned the drop in the number of Armenians living elsewhere in the U.S.S.R.

The second exception concerns the peoples of the formerly independent Baltic republics—Lithuania, Latvia, and Estonia. Although these three republics in 1970 contained more than 90% of the persons claiming their respective nationalities, the heavy influx of Russians since the republics' incorporation into the U.S.S.R. in 1940 had by 1970 reduced to between 57% and 80% the three nationalities' share of the total population of their respective republics. This relative Russification is not unusual, for a similar process is under way in the five Central Asian republics. What is unusual is the deportation of large numbers of Lithuanians, Latvians, and Estonians and their subsequent statistical disappearance. Instead of

accounting for the whereabouts of 99.5% to 100% of the nationals of these republics, as was the case with the nationals of the other 12 Soviet republics, the 1959 statistics located only 94% of the Balts. Of the unlocated 6%—some 294,000 persons—63,000 did turn up in more detailed listings for Moscow, Leningrad, and areas adjacent to the Baltic republics. The remainder can be assumed to be scattered across Siberia, Kazakhstan, and other remote parts of the U.S.S.R.

Statistical hide-and-seek was also played in 1959 with several smaller nationalities, most blatantly with those uprooted from their homelands between 1941 and 1944—the Chechens, Ingush, Karachai, Balkars, Kalmyks, Volga Germans, and Crimean Tatars. The first five of these nationalities were rehabilitated in early 1957 following charges of collaboration with the enemy in World War II, and they were allowed between 1958 and 1960 to return to their homelands located between the Black and Caspian Seas in the R.S.F.S.R. The Germans were rehabilitated in 1964 and the Crimean Tatars in 1967, but neither group was allowed to resume its former residence. The 1959 census, by a combination of precision and vagueness, showed how the pace of resettlement varied for each of these peoples. As may be seen in the following percentage tabulation, the census specified the whereabouts of those who had returned to their native areas, but left unstated the location of nonreturnees. By 1970 resettlement was essentially complete, as may be seen by comparing the percentages of these nationalities residing within the borders of the R.S.F.S.R. in the two census years (N.B. The 1959 Kalmyk figure is distorted by the fact that this nationality was exiled to Siberia, within the confines of the R.S.F.S.R., while the other four nationalities were sent into exile in the non-Russian Central Asian republics.).

	RESETTLED 1959*	IN EXILE 1959**	RESIDENT IN RSFSR	
			1959	1970
Karachai	85.1	14.9	87.7	94.7
Balkars	80.4	19.6	83.3	88.3
Kalmyks	73.1	26.9	95.3	95.6
Chechens	61.3	38.7	62.3	93.3
Ingush	51.3	48.7	52.8	86.7

*In native region or adjacent areas.

**No locality mentioned.

The 1959 census acknowledged the existence of approximately 1,620,000 persons of German nationality. This figure included not only the uprooted Volga Germans but also ethnic Germans from the Ukraine, Siberia, and the large cities, as well as individual refugees, former prisoners of war, and deportees who had decided to remain in the U.S.S.R. The census placed 50.6% of these Germans within the R.S.F.S.R. but did not specify where, and not even this degree of imprecision was provided for the remaining 800,000 persons. In 1970 the number of Germans had grown to 1,846,000, but no breakdown on their distribution is yet available. Even more summary treatment has been

extended to the Crimean Tatars, who are simply included as part of the general category "Tatar"—a category which also covers the Volga Tatars, Siberian Tatars, and other scattered groups. For the closely related latter groups, such lumping together does not create significant distortions, but the Crimean Tatars differ from the other Tatars to the same extent that the Ukrainians differ from the Russians. Although the fate of the Germans and Crimean Tatars has been more frankly discussed since 1959, the continued lumping together of Volga and Crimean Tatars and the omission of statistics on the whereabouts of the Germans in the preliminary 1970 nationality figures does not encourage one to expect significantly greater precision when the final results of the 1970 census are released.

Ethnic tensions exist between the various nationalities of the Soviet empire, but except for anti-Semitism they are given little publicity and are usually kept under control. Nevertheless, these tensions present a serious problem to the regime. Among the more notable examples of intra-Soviet hostility are the Balts' hatred for the Russians and the mutual antipathy between the Georgians and the Armenians. For their part, Russians tend to be condescending toward all the other ethnic minorities, particularly the non-Slavic peoples. Proud of their culture, their material advances in the face of a harsh climate and foreign hostility, and the present Soviet position of influence in world politics, the Russians consider fitting the role assigned them in Soviet doctrine as the "elder brother" of all the other Soviet peoples. Even so, they privately admit to feelings of cultural inferiority to the Baltic peoples.

Russian nationalism has received varying degrees of official encouragement ever since the early 1930's, with the aim of counterbalancing minority nationalisms and the stresses imposed by the stratified social system. At the end of World War II the Russians were officially recognized as having made the largest contribution to victory. The histories of the minority peoples have subsequently been rewritten to show that their contact with the Russians brought them to a higher civilization and a better way of life. This indeed is a far cry from the Soviet propaganda of the 1920's, which condemned such "Great Russian chauvinism" as a tsarist device to keep down the minority peoples. Since the death of Stalin the government has tended to play down Russian nationalism in the hope of preventing any spontaneous development which could promote anti-Soviet feelings. Instead, the concept of Russian cultural hegemony has been enunciated more subtly and skillfully, with greater emphasis on the alleged common desire of all Soviet people to build a new Communist society.

Soviet law grants most minority languages equal status with Russian in areas where the former are spoken, but in practice Russian has greater prestige and practical importance, particularly in the less developed minority areas. Among culturally developed minorities, such as the peoples of the Baltic republics, the Georgians, and the Armenians, wide use of Russian creates a certain friction, and even among less

developed minorities, such as those of Central Asia, this has provoked a limited resistance. Minority languages are granted equal status in many fields, including law and public administration. Trials are usually conducted in the language spoken by the majority of the people in a given area, and interpreters are supposed to be provided for those who cannot understand the language of the proceedings.

The Soviet constitution guarantees each citizen the right to instruction in his native language. Primary education is provided in most indigenous languages, but secondary and some higher education is conducted only in the more important languages. The most widely publicized lapse in this guarantee is the nonexistence of Yiddish-language schools for those Jews who wish to keep alive the Yiddish cultural tradition. All such schools were closed in 1948 as part of the regime's campaign against "cosmopolitanism"; the effects reached even to the Jewish Autonomous Region in eastern Siberia.

Many non-Russians find themselves forced to study in Russian schools from the outset if they wish to continue their education into the upper secondary grades and beyond. Compounding the annoyance to the minorities caused by the pervasive Russian-language training in Soviet schools is the fact that Russians resident in minority areas have for the most part not shown themselves amenable to taking instruction in the local language. In 1959 children belonging to minority language groups were given the right to choose another foreign tongue as their second language instead of Russian, but since most parents and students know how necessary Russian is for advancement in Soviet society, this concession has had little effect on the extent of Russian training among the minorities.

The Soviet Government supports the use of minority languages by publishing newspapers, magazines, and books in these languages. In 1969, for example, books were printed in 61 Soviet languages,⁶ newspapers in 57, and periodicals in 46. In addition books were printed in 40 non-Soviet languages, newspapers in nine, and periodicals in 22, some of which, such as Hungarian, Greek, Korean, German, Polish, Finnish, and Romanian, were used to address both domestic and foreign audiences. Since 1964 the volume of minority language publications in the non-Russian republics has expanded faster than that of Russian publications in those areas. Nonetheless, 79% of the books published in the U.S.S.R. in 1969, as well as 84% of the periodicals and 76% of the newspapers, were in Russian.

The influence of the Russian language has extended to the minority languages as well. The Cyrillic alphabet used by the Russians, Ukrainians, and Belorussians was originally designed in Byzantium as the medium for spreading Eastern Orthodoxy among the Slavs. Variants were developed as early as the 14th century by the

⁶Languages associated with the various minority nationality administrative units.

Russian Orthodox Church to spread the gospel to the Finnic, Turkic, and other smaller peoples living on the periphery of the Russian realm.

Following the revolution, Soviet linguists decided that the best way to fight illiteracy among the "peoples of the East" would be to introduce a Latin script to transcribe their native languages. A secondary purpose of the Latinization was to weaken these peoples' ties to Islam, which exerted a cultural influence through an Arabic script it had developed for the various Turkic and Iranic languages. Beginning in the early 1930's a recrudescence of Russian nationalism prompted a shift away from Latinization, and variants of the Cyrillic alphabet were developed and substituted over the next decade.

Pressures for Russification have been evident in the practice of bringing new words into the Cyrillic-script non-Slavic languages with the same spelling used in Russian, even though Russian letters may represent sounds that do not exist in the minority languages. The regime has also purged many minority languages of words borrowed from foreign languages and has replaced them with Russian words. The Lithuanian, Latvian, Estonian, Finnish, Polish, and German languages utilize Latin letters; the Georgian and Armenian alphabets are unique; Yiddish uses the Hebrew script; all other major languages of the U.S.S.R. are now written in the Cyrillic alphabet.

The use of the Cyrillic alphabet for the languages of the Central Asian peoples has complicated their communications with related nationalities outside the Soviet Union. The regime has also sought to obscure similarities between closely related tongues within the U.S.S.R. Fearing the growth of pan-Turkic or pan-Islamic sentiment, the Soviet Government has established in Central Asia more official literary languages than are called for from a linguistic point of view. By hampering written communication among related nationalities in their native tongue, the importance of Russian as the chief inter-national language has been enhanced.

The attitudes of the various minorities to the Soviet regime differ widely. Among the culturally developed nationalities with strong traditions, such as those of the Baltic republics, the Georgians, and the Armenians, intense national feelings, often both anti-Russian and anti-Soviet, remain. They are not content with merely being allowed a self-expression which, while "nationalist in form," must also be "socialist in content," following strictly set guidelines designed to promote Soviet patriotism and the building of communism. As a means of countering the centralizing pressures of the state, these peoples strive to preserve their autonomy and on occasion have sought in small ways to expand it. They also tend to cultivate feelings of superiority to the Russians and attempt to insulate themselves as much as possible from Russian influence and from the Russians in their midst.

Among the relatively backward peoples, such as the Buryats, Yakuts, and Bashkirs, the Soviet nationality

policy has been more successful. To these peoples, Western civilization is equated with the U.S.S.R., and the regime, by offering them an opportunity to take part in Soviet cultural life, has been able to build a certain loyalty to it. Other, less backward peoples, such as those of Central Asia, seem to appreciate the economic advances which they have made under Soviet rule, but as far as possible they prefer to adhere to many of their traditional social and cultural patterns. Indeed, the Soviet policy of exaggerating the historical and cultural differences between the Central Asian peoples has, in fact, tended to heighten a sense of national identity among the individual groups—in particular among the Uzbeks. Ironically, this is manifested in openly anti-Russian attitudes. Uzbeks actively resent the generally more privileged status accorded Russian *colons* in their republic, and this resentment occasionally is vented in anti-Russian riots at soccer matches between the two nationalities.

The attitude of the Russians' Eastern Slavic kinsmen, the Ukrainians and Belorussians, is more ambivalent. The regime has tended to minimize the differences between the three nationalities, and by denying to Belorussians and Ukrainians residing outside their native republics access to instruction, cultural life, or newspapers in their native tongue, it has contributed to their Russification. During World War II the Ukrainians and Belorussians, reinforced by contingents of their peoples who had been only briefly under Soviet rule following the 1939 partition of Poland, reasserted their separateness from Moscow. Following Soviet reoccupation of the area, centers of resistance were ruthlessly crushed and their leaders dispersed, and there has been only a slight easing of the restraints since then.

In general, this course has met with little resistance among the Belorussians, but the Ukrainians have undergone a remarkable revival of national sentiment. In the mid-1960's at least 70 Ukrainian writers, artists, and students were arrested for protesting increased Russification and the loss of local autonomy. Charged with disseminating material unfavorable to the regime, these persons were sentenced in early 1966 to jail terms of up to 6 years, repeating the experience of the Russians Sinyavskiy and Daniel, whose trial was held at the same time, but in Moscow. These trials in turn evoked extended protests, notably by I. Dzyuba and V. Chornovil, both of whom were arrested for their efforts, thus following the precedent set by the Russians Galanskov and Ginzburg, who protested the Sinyavskiy-Daniel trial.

Ukrainian national sentiment persists, despite regime efforts to suppress it, and while the number of active dissidents is quite small relative to the total population of the Ukraine, it is sufficiently large to sustain itself and attract new adherents. The Soviet Government thus finds itself in a dilemma. If it liberalizes its policies, the advocates of the newly aroused Ukrainian nationalism will make every effort to spread their influence openly, while if the regime chooses to resort to even more

stringent measures, the result will doubtless be a string of national martyrs whose tribulations can only reinforce the prevailing anti-Russian sentiment.

2. The family and the individual

The behavior patterns in the great majority of Soviet families resemble those in families in the industrialized West European countries. The major distinguishing feature in the Soviet family is its subordination to and circumscription by the state. Such dependency may be fostered materially by lower living levels and a real need to remain on good terms with the state authority—notably in the areas of housing, employment, and higher education.

There are significant variations in the relative value which the various Soviet peoples attach to the family as an institution, as well as variations in the effect of family relationships on the other institutions of society. The Central Asian family, for example, with its respect for religious sanctions, emphasis on perpetuation of the male line, and extension of family relationships into political and economic life, presents a sharp contrast to the modern Russified family, where, as in Western countries, family ties have been attenuated and family influence has become negligible.

The regime follows a nationwide policy of remaking the family according to a prescribed nationwide model, with the primary allegiance of the members to the state rather than to each other. To achieve this objective the regime uses all the powers at its command, including legislation, police control, education, and propaganda. The process of urbanization, wherever industry has entered, has tended to accomplish the same end, drawing the youths out of the family at an early age, reducing the family size, and splitting the family structure into its smallest possible unit, the nuclear family. Inter-marriage of members of the various non-Russian nationalities with Russians migrating in large numbers into their areas may become another influence for change, but present indications are that such marriages are the exception in most areas.

The central government reserves for itself the "determination of the principles of legislation concerning marriage and the family." As there is no family code for the U.S.S.R., the regime has until recently applied the R.S.F.S.R. code on a nationwide scale. In view of the fact that changes occurring in the family in the R.S.F.S.R. have occurred in the rest of the country at differing rates, and in the face of varying resistance, the authorities have decided to enact separate codes for the different republics, the first of these coming into effect in Kirgiziya in 1970. The importance the regime attaches to family legislation is reflected in the fact that decrees altering the marriage and divorce codes were issued even before the Bolsheviks were firmly established, and preceded the official separation of church and state, establishment of provisional soviet organizations, definitions of the rights and duties of local soviets, and many other measures which might have been deemed more important to a new government struggling for survival.

The most complete embodiment of early Soviet policy toward the family is contained in the 1926 "Code of Laws on Marriage and Divorce, the Family, and Guardianship." This code, which remained in effect until 1936, was motivated by the Marxist mandate to destroy the family as an instrument of "bourgeois exploitation" and by practical considerations to minimize parental influence potentially unsympathetic to the regime. Under the 1926 legislation, which codified and supplemented the decrees and practices of the previous decade, control of marriage and divorce was taken away from the family and church, and a simple registry procedure in the Government Civil Registry Office (ZAGS) was substituted. The institution of notifying the ZAGS office by mail of any change in family status led to a rash of postcard divorces in European Russia. Furthermore, persons living together who wished to omit the formality of a registry marriage could do so without censure and could legalize their relationship retroactively at any time. Children born out of wedlock were granted the same rights as others, and the same duties were required of them. Legal resources were provided to the mother or guardian to establish paternity and force the father to contribute to the child's support. Abortion was legalized and could be obtained free of charge at government hospitals. Payments to mothers were instituted; criminal penalties for wife-beating established; and the right of a wife to a joint interest in property accumulated during married life was recognized. Wives were also allowed a choice of maintaining their family surname, using a combination of their surname and that of their husband, or, following tradition, adopting the husband's surname.

By the 1930's it became evident that the regime's success in weakening family ties had had a number of detrimental and unforeseen side effects. Notable among these were a falling birth rate, a rising divorce rate, widespread juvenile delinquency, and disrespect on the part of the young for all authority. Changing course, the state denounced advocacy of a free, unbound, socialist family as "left deviationism" and returned to the ideal of a disciplined, stable family. In 1936 heavy criminal penalties were set for women undergoing abortion, for doctors who performed the operation, and for those who encouraged it, except in cases where the health of the potential mother was in danger or where she was suffering from a highly infectious disease. Popular feeling favoring abortion was strong, however, and illegal abortions remained a major problem. The prohibition was finally repealed in 1955, and abortions were again legalized if performed in hospitals, but such operations remained illegal if performed independent of state supervision.

Divorce fees also were established in 1936, ranging from 50 rubles for the first divorce to 300 rubles for the third, instead of the former nominal fee of 15 rubles for registration of either a marriage or a divorce. Marriage was declared to be a solemn affair. The registry offices were made more attractive, and the manufacture of wedding rings was revived. If an individual was

divorced, the fact was entered on his internal passport. Penalties of up to 2 years' imprisonment for nonpayment of alimony were instituted. The divorce law of 1944 introduced even greater stringency. Divorce could no longer be obtained by simple registration but only through court action. If either party failed to appear in court, the case was suspended. Both parties had to submit to attempts at reconciliation in the first court in which they appeared. If these failed, the case would be taken to a higher court. No grounds for divorce were specified beyond stating that the family had broken up and could not be restored. If a divorce was obtained, the parties had to pay expensive court costs. In 1965, following long years of public complaint, the divorce laws were amended to make the proceedings less costly and less time consuming. With the changes, the Soviet divorce rate jumped from 1.6 per thousand in 1965 to 2.8 per thousand in 1966 and seems to have stabilized at the higher level.

The 1944 laws affecting the family reversed another government policy—recognition of unregistered marriages and equal treatment of legitimate and illegitimate children. A child born out of wedlock no longer was entitled to inherit on equal terms with children of a registered marriage. To substitute for the former support given such a child, the government supplied minimal assistance to the unmarried mother until the child was 12. A mother wishing to prove the paternity of an illegitimate child was denied the use of the courts, and the child could use neither the father's family name nor the patronymic.

Following widespread discussion during the postwar period of the problems raised both for the mother and for the children in unregistered marriages, a new family law was adopted in 1968. Although under it unregistered marriages did not regain full legal status, children born to couples living together for an extended period of time or having established a firm relationship could claim inheritance. Mothers were allowed to sue to establish paternity, and, if successful, had the right to expect the father to contribute to the child's support.

Since 1944 the regime has extended its financial and social aid to the family, at the same time penalizing the childless, whether married or not, by taxation. With the birth of the third child, a family receives a lump-sum payment, and monthly allowances begin with the fourth child. Employed mothers receive liberal maternity leave allowances and a special stipend from the place of employment. Mothers of large families are honored with medals and orders glorifying motherhood. According to the 1944 law, a person may be prosecuted in court for "insulting and debasing the dignity of women and mothers." By the same token, leading a loose moral life and shirking family responsibility are grounds for expulsion from the Communist Party.

The 1959 census provides the only available data on family size. For the majority of the population, the characteristic family living as a unit is the immediate or nuclear family, consisting of father, mother, and children. In 1959 approximately 95.5% of the Soviet

people were classified as family members, the remainder being listed as single persons living alone. There was an average of 3.7 persons per family in 1959, with urban families averaging 3.5 persons and rural families, 3.9. The number of children in contemporary Soviet families appears to vary inversely with the family's place in the social structure. Families better off economically tend to restrict the number of children and use their resources to improve their standard of living.

Officially, a parent's mandate to govern his children comes not from the fact of procreation but from the government, which assigns him a responsibility for bringing up citizens bound to that government, not to himself or the family. The regime, through its representatives in the party, trade unions, or schools, may intervene in the rearing of the child. If the child misbehaves, does not do well in school, or makes deviationist statements, the parents are held responsible.

In rearing a child, Soviet parents, instead of stressing religious principles and the virtues of thrift and application, are more inclined to inculcate a set of ethics divorced from religion and to foster caution in social relations and actions. Pragmatic adjustment to the authoritarian regime is considered prudent, as is an awareness of the elements which make for a successful career and material reward. Thus, ideological flexibility and political conformity are often urged on young people by their parents, and a sound technical education is often sought for young women as well as young men. Blind obedience to authority, which the regime would like to see instilled by the parents, has not become an objective of family training. Instead, the parent is content to teach the child how to stay out of trouble. Political teaching is generally avoided in the home, as is open expression of dissatisfaction with conditions or with the regime's policies. Parents are aware of the ability of school authorities to elicit from children information on parental attitudes, and, indeed, they are aware of the transitory nature of many official ideological stances.

Official propaganda has constantly insisted that parents must be strict, but Soviet parents seem to have intensified their loving relationship with their children as their authority over them has been weakened. Since the traditional authority of the father has been taken over by officials in the schools and the party, parents no longer seem to expect or hope for the obedience and solidarity that once characterized the Russian family. Children now are expected to be taken from the family at an early age, either to be sent to work or to undertake study far from home before they are out of their teens. Thus, greater emphasis is placed on the husband-wife relationship as the supporting, constant one. Furthermore, as parents are responsible for the acts and thoughts of their children, a man's wife becomes the only refuge left him for a relatively free expression of ideas.

The party prescribes norms, social values, and standards of morality to be followed in all aspects of life.

The positive image of the ideal citizen developed by the regime is propagandized as the "new Soviet man." This abstraction is devoid of all survivals of the past and places the interests of the state above those of himself and his family. The "new Soviet man" is unquestioningly devoted to the tenets of Marxism-Leninism and gives unstintingly of his time and energy to further the Communist cause. At the same time he is disciplined, obedient, temperate, puritanical in conduct and motivation, and steady in mood.

Although the party has secured a general measure of surface conformity to this ideal, personal interest very often motivates actions contrary to the general welfare as defined by the regime. Laws restricting private enterprise are often violated. There is a good deal of speculative buying and selling by workers and peasants. Drunkenness and "hooliganism" not only persist but seem to be increasing, despite measures taken by the regime to combat them. The crime rate may also be rising. The constant propaganda barrages exhorting the population to be patriotic and obey Soviet laws belies the party's assertion that the people wholeheartedly support its program.

The state discourages alternative loyalties to churches, geographic regions, and friendship groups, unless sanctioned by the party. The organizational ties which are allowed and encouraged are those to instrumentalities of the state and the party, such as the Komsomol, trade unions, cooperatives, civil defense and sports groups, and assorted cultural, professional and technical societies. The general frustration of the Russians' natural gregariousness and the rigid controls imposed by the state have left their mark on the Soviet citizen. Despite surface conformity, many individuals struggle to preserve a shred of personal independence; often the manifestations of this struggle are escapist and are condemned as antisocial. Such manifestations include drunkenness, a liking for foreign clothes and trinkets, attraction to "decadent" forms of entertainment, and, on a higher level, preoccupation with the past and with scientific and technical occupations as little concerned with politics and ideology as possible. In all segments of Soviet society there is a desire to be left alone. Many citizens just want to live their lives in peace, raise their families, work at their jobs, and enjoy recreation and the company of their friends with as little involvement with the state and party as possible.

3. Social structure

In the early years of the Communist regime, the leadership called for the liquidation not only of the rich and the middle classes but also of all disparities ("contradictions") between urban and rural workers and economic differences and privileges which determine social classes. Although the ultimate goal of a "classless" society remains part of Communist theory, successive modifications concerning the means to achieve such a society have resulted in the continuation of disparities in the social structure. Thus, contemporary Soviet society tends to conform with other expanding,

industrial societies, with social differentiations based on occupational groupings, perpetuating the sort of distinctions that traditionally provide the basis for social classes.

A more distinctive feature of Soviet society is the existence of two additional social differentiations which cut across or merge with essentially occupational groupings. The more important of these is the unequal division of the population into party and nonparty members. The second is the distinction between Russians and non-Russians, which places Russians in the responsible positions with the highest pay, privileges, and political power in all areas of the U.S.S.R.

The persistence of social classes has conflicted with the regime's ideological commitment to a classless society. Thus, the regime has repeatedly had to modify ideology to bring it into partial accord with reality. While its goal is a society guided by the principle "From each according to his ability, to each according to his needs," the regime claims that in building communism Soviet society must continue to be governed by the maxim "From each according to his ability, to each according to his work." As the work of various groups, such as peasants and urban workers, differs, so does their reward in terms of life style, responsibility, and power.

Differences in society because of wages, membership in influential organizations, particular types of employment, education, character, native intelligence, ethnic origin, or religion are not considered by Soviet theorists to be evidence of social exploitation or to be sufficient in themselves to demarcate "antagonistic" social classes. It is sufficient for them that all the traditional "exploiting" classes—that is, the nobility and bourgeoisie—have been eliminated. Communist theorists do, however, recognize two "nonantagonistic" classes, the workers and the peasants, and one "stratum," the intelligentsia. According to Communist theory, though each of these groups has different status within the system, they are all interconnected through co-ownership of the most important means of production. Figure 58 details the development of the new class structure of Soviet society, as interpreted by Soviet statistics. In terms of the three officially recognized groups in society, the Soviet population

FIGURE 58. CLASS COMPOSITION OF THE POPULATION, BY PERCENT, 1913-69

	1913	1928	1939	1959	1969
Workers and employees.....	17.0	17.6	50.2	68.3	78.41
Collective farm peasants and members of craftsmen's co-operatives.....	...	2.9	47.2	31.4	21.56
Individual peasants and craftsmen.....	66.7	74.9	2.6	0.3	0.03
Bourgeoisie, landowners, merchants, and large farmers....	16.3	4.6	...	...	...

... Not pertinent.

25X1

consists of 20% intelligentsia, including white-collar workers; 30% peasants, including state farm workers; and 50% workers.

The worker and peasant classes can each be subdivided into three groups. Those in the upper group of workers are the most highly skilled; they more or less consistently overproduce their quota. Members of this group receive higher pay, special awards from the regime, special vacation leave, and other bonuses. In terms of prestige and economic position, they overlap the lower reaches of the white-collar group in the intelligentsia. The majority of workers, however, are in the rank-and-file. Only semiskilled, their estimated average wage in 1969 was 1,497 rubles. This large group shades off into the unskilled, a relatively unproductive group of workers estimated to make up 20% of the work force. Most of these, who earn a minimal wage, are new arrivals in the urban work force and frequently have completed only a minimum education.

At least a few peasants are relatively well to do and form the upper group of the peasantry. However, the per capita annual income for the collective farm peasantry, estimated in 1968 to be only 686 rubles, ranks the more prosperous members of this group only above the low-paid unskilled workers and not above the rank-and-file. Most prosperous peasants have achieved their position through membership in a collective farm that has been exceptionally fortunate in terms of type and amount of crop, fertility of land, and location. Some peasants on less favored farms may, through skill or development of "model farm practices," achieve the higher income and official recognition that will place them in the prosperous group. Transitional between the prosperous collective farm peasantry and the industrial rank-and-file are the state farm peasants, who share the rural way of life with the collective farm workers but are paid wages by the state for their labor instead of depending on the vagaries of nature and consumer demand. In 1968, workers on state farms received an estimated average annual income of 1,098 rubles. The bulk of the rural work force, however, is lower on the social and economic scale than almost any industrial worker. Still further down the scale are the few remaining independent peasant farmers and the poorest collective farm peasants.

While the regime prefers to lump together a great many occupational and status positions under the rubric "intelligentsia," this group can be subdivided into an elite, a traditional intelligentsia, and a white-collar group. With the exception of the elite, which owes its position to the possession of political power, divisions within the intelligentsia are determined by such factors as income, education, types of employment, and a system of privileges and bureaucratic rank. Ethnic considerations are not of fundamental importance, although Russians are more heavily represented in the higher ranks. Nor are the over 14 million Communist Party members (as of 1970) guaranteed a privileged position in society, although party membership is an important prerequisite for advancement.

The white-collar group is the largest in the intelligentsia and includes a variety of nonmanual workers, descending from petty bureaucrats, through accountants and bookkeepers, technicians and teachers, down to ordinary clerks and salesgirls. Although the regime, for internal propaganda purposes, persists in lumping the white-collar group with the political elite and the traditional intelligentsia as a means of blurring the privileged group into the general population, the workers and peasants generally distinguish between the two higher groups and the ordinary white-collar workers. This latter group is broad not only in diversity of occupation but also in range of salary. The average salary is only slightly above the industrial worker's level, but a few earn an income as much as 10 times that amount. The members of this group have little in common, save a desire to maintain their position in Soviet society, and to do so many belong to the party or Komsomol.

The traditional intelligentsia includes those occupying the upper and middle ranks in the party, government, economy, and military; most scientists, artists, and writers; engineers, managers of industrial enterprises, heads of collective and state farms, and others in responsible administrative positions; and those, regardless of their occupation, who are well educated. To some extent these groups form exclusive, strongly hierarchical castes along with some members of the white-collar group in the same line of employment. This generates occupational group loyalties apart from general class distinctions. Those belonging to the traditional intelligentsia are well paid, with earnings averaging five to ten times the average worker's wage, but rank and privilege are probably even more important considerations. Within this group the percentage of membership in the Communist Party is high, and the majority have had a higher education. The members of the traditional intelligentsia are well rewarded because their capabilities are in greatest demand and their allegiance is essential for the regime's continued existence. Yet members of this group are not free from censure in instances of poor performance or undesirable political tendencies, and they must bear the brunt of recurrent criticism in politics, the arts, and sciences.

The elite, numbering approximately 10,000 persons, is composed of the top party officials, senior government, economic, and military officials, and prominent scientists, artists, and writers. The elite is sharply differentiated from other Soviet groups, and there is little overlapping with the traditional intelligentsia. Despite the elite's predominance in authority, rank, and responsibilities, however, its remuneration and privileges are not much greater than that of the traditional intelligentsia. The elite shares with the intelligentsia the various perquisites attached to their positions, such as priority in housing, medical care in special clinics and accommodations in the best sanatoriums, access to special stores and restaurants, and special opportunities for family members. Entry

into the elite is difficult. Entrants must combine ruthlessness, great drive and ambition, ability in some specialty, and at least some capacity for scheming and maneuvering. Connections are also important, as many individuals rise to the top as proteges of one high official or another. The educational level of the elite is high, usually consisting of technical training. This education, however, has not been sufficiently broad to provide less intellectually gifted members of the elite with the critical ability to distinguish dogma and stereotypes from reality when making decisions. Despite their different activities, members of the elite belong to the party—a fact which tends to insure uniformity of interest and outlook and deters the development of particularistic interests counter to those of the top party leaders.

Despite the leap which must be made to pass from the peasantry or working class into the intelligentsia, or from one layer in the intelligentsia into another, the Soviet social system is more fluid than that of prerevolutionary Russia. Individuals have greater opportunity to move up the social ladder on the basis of demonstrated political and technical merit. In the early days of the regime this mobility derived from the fluid revolutionary situation and was continued by the rapid expansion and growth of the industrial sector of the economy. This social mobility proved a great source of strength to the regime, since people rising into the intelligentsia and the leading section of the working class had a stake in maintaining the system that provided them positions inconceivable under prerevolutionary conditions. The presence of officials, scientists, and artists of peasant and working-class background, even though their actual number is exaggerated by the regime, demonstrates to the people that individual productive, political, and administrative abilities can receive recognition.

The higher the individual rises in the social structure, however, the greater the possibility that the current may suddenly reverse and drag him down, possibly below where he started. The vulnerability associated with higher positions has been known to deter some talented individuals from aspiring to them. Thus the party must actively seek out individuals with proficiency as technicians and leaders. This seeking out of potential leaders is a twofold process reinforcing the system. The capable are mobilized to serve the interests of the regime and are assured proper recognition, while those who are talented but refuse to join the party become suspect.

The early egalitarian philosophy of the party stressed equal opportunity for both men and women, and this is another avenue for mobility opened by the Communists. On the basis of occupation, working women theoretically are accorded the same position in the social structure as men. There have been instances, however, where job ratings have been manipulated extralegally so that professional women are paid somewhat less than men engaged in the same work. Most working women are in agricultural, manufactur-

ing, and other semiskilled or unskilled jobs. Nonmanual workers among women seem to be in relatively "safe" and lower paid jobs—as is the tradition in the United States—such as teaching, nursing, bookkeeping, and secretarial work. The major exception to this is in medicine, where nearly three-fourths of the physicians are women, although even in this field the top positions are usually held by men. Whether by their own choice or by official policy, women are generally excluded from superior party posts and other positions notably high in vulnerability.

While it is questionable that widespread class consciousness has taken root again in the U.S.S.R., there does exist an awareness of and preoccupation with social differences among the population. Each class has its distinguishing marks which make it an identifiable target to others, and these visible distinctions reflect deeper differences in social viewpoint and life style. Each class, in addition, has its own problems, and to some extent other classes in society are seen as either creating these problems or failing to mitigate them.

Since the death of Stalin the government has adopted a number of measures to counteract hardening class lines and reduce growing economic differences. Thus, secondary school tuition fees have been abolished, taxes in the lower income brackets reduced, and the annual compulsory bond subscription drives eliminated. Minimum wages have risen, as have payments to collective farmers, while the wages of the upper income groups have risen less sharply. A general increase in pensions has chiefly benefited lower income groups. Yet, despite these measures, the gap between income extremes remains wide.

Education remains the principal means of surmounting social and occupational barriers. To avoid the danger of developing a permanent and closed elite, but at the same time to meet the need for an army of technicians to staff the ever larger and more complex economy, the regime has made several efforts to expand the educational opportunities available to the nation's youth. Khrushchev in particular attacked preferential schooling assignments based on parental influence rather than on merit and the marked underrepresentation of students from worker and peasant families in higher educational institutions. The 1958 school reform, in addition to making available some financial aid, provided for an expansion of correspondence and part-time schools to give worker and peasant youths a better opportunity to continue their education. The academic standards in these schools were not equivalent to those in full-time schools, however, and their graduates remained at a disadvantage in competition with students from full-time schools for admission to higher educational institutions. The 1958 reform also made some effort to restore balance among applicants by requiring 2 years of work in production for all but the top fifth of applicants to higher educational institutions. After persistent criticism that these innovations lowered academic standards, the regime dropped the 2-year work requirement and substituted a percentage

distribution in admissions among graduates of full-time secondary schools, production workers, and demobilized servicemen. Despite these efforts to increase social mobility, the children of the upper classes still enjoy a relative advantage by virtue of their parents' higher income, more cultured home background, favorable geographical location, and personal influence and connections.

4. Social values and attitudes

The disparate nature of the nationalities in the Soviet Union and the varying attitudes toward the regime have been treated above in the discussion of ethnic and linguistic divisions. It was seen that the outlook of the Soviet people generally could best be characterized as passive acceptance. What enthusiasm or devotion exists among national, as opposed to social, groupings seems confined largely to the dominant Russians. Alienation in attitudes appears to proceed by degree—from resentment of cultural impingements among the Eastern Slavic kinsmen, the Ukrainians and Belorussians, through culturally conservative resistance by the less developed nationalities in Central Asia and Siberia, to ill-disguised hostility among the culturally developed non-Russian nationalities, notably in the Baltic republics and the Caucasus.

Attitudes toward the regime similarly vary among the social groupings in all the republics, with those in positions of authority and responsibility evidencing the greatest support and those most distant from the sources of power, the least. As has been noted in the discussion of social structure, a new class structure has developed in the half century since the revolution and its dissolution of the old classes. The divisions or gradations in this structure have come to be analogous to the class divisions in Western societies, as have, in general, the diminishing degrees of identity with the system as one moves down from the top of the social pyramid.

Of all the social groupings, the peasantry appears to live the least satisfying life. Though his lot has improved significantly in the post-Stalin period, the peasant is still worse off than the average industrial worker. He is much more likely than members of other groups to feel that he has been denied educational opportunities and that his economic rewards have been inadequate. Yet because of the persistence of tradition in the countryside, he is the least concerned about the absence of the civil liberties familiar to people living in Western, non-Communist societies.

There is a wide divergence of outlook, aspiration, and degree of satisfaction among industrial workers as a result of the official policy of wide pay differentials and other rewards, but for the most part the workers accept the Soviet industrial system. Skilled workers tend to be more favorably disposed toward the regime, have more hopes and ambitions for self-improvement, and derive more satisfaction from their work than do unskilled workers. They also tend to be more optimistic concerning the possibility for harmonious relationships between classes than do unskilled workers.

The establishment attitudes and outlook of the bulk of the intelligentsia reflect this group's generally favorable position in Soviet society. Intellectuals in many fields derive considerable satisfaction from their work, in sharp contrast to peasants and manual workers. Their tradition of service and their generally secure material position make them more disposed to accept a system which subordinates the individual to the state. Yet it is in this relatively privileged class that much of present-day Soviet dissidence is concentrated.

Dissent within the intelligentsia has been a fairly constant phenomenon in Russian and Soviet history, and in the wake of the de-Stalinization campaign initiated by Khrushchev in 1956, many intellectuals believed that their efforts could contribute to steering the system to a more democratic pattern based on law. The regime response to the first glimmerings of this movement in literature vacillated between tolerance and quixotic repression, but by 1964 many intellectuals were confident of early positive developments.

The arrest and trial of the writers Sinyavskiy and Daniel in 1965-66 marked a turning point in the relations between the regime and the small band of dissenters. Every subsequent attempt by the government to suppress protest by jailings, exile, or confinement to mental hospitals produced new recruits to the protesters' cause. Numerous letters to the editor, petitions to government and party leaders, appeals to the United Nations, and public demonstrations were organized to protest the government treatment of cultural figures and general violations of the Soviet constitution and the Universal Declaration of Human Rights. At the same time contacts with foreign correspondents assured that the dissenters' case, even if not heard at home, would receive an adequate, and at times excessive, public hearing abroad.

One of the breakthroughs in the dissidents' efforts to broaden their very small base was the attraction of a few members of the highly privileged scientific community to their cause. The most notable of these was the physicist A. Sakharov, one of the developers of the Soviet hydrogen bomb, who in 1968 issued a remarkable tract on "progress, peaceful coexistence, and intellectual freedom" which pointed to the eventual convergence of the Soviet and American systems. One of the reasons for the breakthrough was the growing fear that the regime was gradually moving to a more repressive policy resembling an attenuated form of Stalinism, and every effort had to be exerted to avoid this. The regime response was to expel individual scientists and mathematicians from the party, a hitherto unprecedented step, while those outside the party were arrested or subjected to psychiatric examination. At the same time the press and airwaves were blanketed with stern warnings against the subversive effect of liberal reformist ideas.

The regime has apparently succeeded in isolating the dissenters from the bulk of the population, but it has been unable to prevent occasional new outbursts. Thus, in 1970 Sakharov and other scientists issued a new

program calling for the extensive democratization of Soviet life and an end to the party's total domination of society. As the regime's repression has heightened, Sakharov and his group have become increasingly engaged in the protest movement, and while every sign points to their eventually being silenced, their effort has been a remarkable demonstration that the Russian intelligentsia's traditional advocacy of freedom lives on even among the most privileged classes of Soviet society and more than a half-century after the revolution.

In general, the attitude of the population toward the regime may be summed up as passive obedience without marked enthusiasm. Although the regime has in large measure removed the terror of Stalin's police state and has made efforts to alleviate many of the deprivations experienced by Soviet citizens, these reforms have by no means changed the people's fundamental attitudes. So far as the dominant Russian people are concerned, occasionally ambivalent feelings toward the rulers in no way compromise their intense and unequivocal loyalty to the nation.

The traditional values of the Russians, Ukrainians, and Belorussians were formed under the strong influence of Orthodox Church teachings, a predominantly rural economy, and an authoritarian political system. The peasant mentality was marked by fatalism, patience, and obedience and was generally weak in the spirit of individual initiative and competitiveness. During most of Russian history prior to 1917, the political, economic, and social system precluded substantial social mobility. Since the peasant had little hope of improving his position, and the well-to-do had little fear of losing theirs, there was little incentive for exceptional effort on the part of the individual.

The Marxist-Leninist ethic runs counter to these traditional attitudes. A fundamental premise of the Soviet regime is that it can change the character of the people of the U.S.S.R. and mold a "new Soviet man." To this end the regime has expended probably as much effort as it has in its drive for economic and military strength. While requiring unquestioning political obedience, it wants this obedience to be willing and active, not fatalistically acquiescent. It wants a population energetic and full of initiative, though only within established limits. In order to achieve this it has campaigned relentlessly against the religious ideal of a heavenly paradise after life, replacing it with the myth of a Communist paradise on earth, to be achieved not by blind submission to fate but by constructive work. By exhortation, education, economic and social rewards, contrived competition, and even legal penalties, it has attempted to reshape its citizens to fit its ideology.

Party and popular desires, however, are often diametrically opposed. The people want nothing so much as material well-being, personal security, and peace, both international and personal. They have little interest in spreading Communist ideology or extending the boundaries of the Soviet state. The regime, on the other hand, is interested in maintaining its own power internally and externally, whether by ideological,

economic, political, or military means. Individually, the great majority of Soviet citizens seek warm personal relationships—the Russians especially tend to have outgoing personalities. The cold, bureaucratic efficiency which is embodied in the ideal of the "new Soviet man" is alien to their nature. Police controls often hamper or completely prevent the sort of personal relationships they desire. In view of facts such as these, there is a strong feeling of alienation between the people and the leadership. The people commonly refer to the party and government as an impersonal "they," distinct from, and often in opposition to, "we." Yet most Soviet citizens (excluding the Balts) do not seem fundamentally opposed to authoritarian rule as such. They object to the type and tempo of the demands made on them, to the paucity of material rewards provided by the system, and to arbitrary and indiscriminate arrest, but not to the principle of subordination of the individual to the state.

Despite the Marxist premise that society develops according to inevitable laws and the Communists' claim that history is on their side, the regime places great stress on individual action, apparently in the belief that rational analysis and resolute action can solve any problem. Individuals, therefore, are called on to tackle unfamiliar technical problems and to work diligently. In the economic field the regime has succeeded to a large extent in overcoming traditional Russian lethargy and passivity, at least in urban areas. But individual action which leads to politically or socially deviant behavior is severely dealt with. Means of achieving conformity run the gamut from persuasion and indoctrination, through reprimands and economic pressure, to police measures. Although the latter are not prevalent as they were before Stalin's death, the possibility of a full-scale resumption provides a powerful stimulus for conformity.

Social values and motivations differ widely between city and countryside, among economic classes, and among different nationalities. Traditional social values are much more firmly embedded in rural than in urban areas, since the former have been less affected by industrialization and official indoctrination. Members of the intelligentsia, especially the managers, technicians, bureaucrats, and party functionaries, resemble more closely the "new Soviet man" than do those of the other social classes. Nationality differences also result in different value systems, but there is evidence that in most cases an individual's attitude is determined more by his social and economic status than by his nationality.

Soviet propagandists maintain that Soviet society is the only completely "socialist" society in the world, representing an advanced type of social organization superior to any other. Soviet society is said to be free of the antagonistic, warring classes characteristic of bourgeois society and exploitation of man by man, and instead provides equal opportunities for all. The great majority of the Soviet populace does not accept this official stereotype and is, indeed, painfully aware of the imperfections and inequalities in Soviet society.

The attitude of the public toward people of other societies and cultures has been conditioned by Soviet propaganda, which claims that the capitalist states are unalterably opposed to the U.S.S.R. and represent a threat, even though they are a "dying" political form. This propaganda, while creating many misconceptions, does not seem to have instilled hostility among Soviet citizens toward most foreigners as such. This may partly be a result of their acceptance of the distinction Soviet propagandists have always made between the "clique of capitalists and militarists" ruling a foreign nation and that nation's "oppressed and poverty-stricken common people." At the same time the official line that only under the Communist system are people free has gained some credence because of the relative isolation of the Soviet citizen and his resulting ignorance of the rest of the world.

The popular attitude toward most European peoples is colored to a certain extent by traditional prejudices. The Poles, for example, are generally regarded by the Russians with distaste, if not contempt, and have been for centuries. This antipathy toward the sister Slavic state tends to be shared by the Ukrainians and Belorussians. Likewise, all three Eastern Slavic peoples tend to hold similar attitudes toward the Germans, with hostile feelings somewhat more marked among the Russians. Generally, there is respect for the Germans' presumed orderliness, technical efficiency, and ingenuity and dislike for their supposed pettiness, meanness, and pedantry. Since World War II these basic attitudes have been expanded to include respect for the efficiency, fighting quality, and might of a German army, and awe mixed with fear at the barbarities Germans have demonstrated themselves capable of committing. Many Russians distinguish between "good" and "bad" Germans, and these categories are applied both to the Communist East and capitalist West Germans. As for the other peoples of central and eastern Europe, popular attitudes are ambivalent, ranging from mild friendliness to apathy. Though most Soviet citizens are satisfied that their nation's ties to the Communist countries of Eastern Europe demonstrate that the U.S.S.R. is not isolated in the world, many doubt the durability of the loyalty of these nations in the event of war.

Despite more than 50 years of propaganda describing the "spiritual decadence" and predatory, anti-Soviet designs of the major Western capitalist countries, the present attitude of the great bulk of the Soviet peoples toward them seems to be a compound of admiration, apprehension, arrogance and pride, and, in varying degrees, a sense of inferiority. The Soviet people are impressed by the material progress of these nations, sensitive to their own country's shortcomings, and resentful of suggestions that they are in some ways a "backward" people. There is a fairly pervasive feeling that the U.S.S.R. represents a moral and spiritual force superior to the materialistic states of the West, and Soviet propaganda appeals to this feeling when it stresses the bizarre and alarming in its treatment of affluent, consumer-oriented America.

Nevertheless, a generally friendly attitude toward Americans persists among the people. This attitude exists partly because of the earlier geographical remoteness of the two nations and consequent lack of traditional conflicts of interest and partly because of the historical image of the United States as a haven for political refugees and a land of opportunity. Acts of friendship and collaboration, such as U.S. famine relief in the 1920's and the alliance and Lend-Lease program during World War II, have also contributed to American popularity. After World War II the Soviet regime went to great lengths to destroy this legacy of good will, and during the Korean war it charged the United States with aggression, bacteriological warfare, and Nazi-style atrocities. Following Stalin's death and the end of the war in Korea, anti-U.S. propaganda subsided, but with the development and expansion of the war in Indochina it has revived. Soviet society, however, is no longer as inaccessible as it was in Stalin's day. A cultural exchange program with the United States has been in effect since 1958, and American tourism is encouraged. The resulting sporadic personal contacts between individual Soviet and American citizens, as well as the occasional U.S. exhibits in various cities of the U.S.S.R., limited as they are, have helped to correct, at least partially, some Soviet misconceptions.

The popular attitude toward the non-Western peoples of Africa, Asia, and the Middle East ranges from tolerance to condescension. The technical backwardness of these countries is attributed to capitalist exploitation and neglect by reactionary, feudal rulers, and the picture of the peoples of these areas struggling to become masters in their own house has aroused some sympathy. Underlying such empathy, however, is a certain ambivalence. An increasing number of Africans, Arabs, and other "third world" peoples have taken up residence in the U.S.S.R. for work, training, or study. The Soviet people's reaction toward them has been decidedly negative, their attitudes paralleling those of Western Europeans exposed to an influx of "uncultured" aliens. Russians traditionally have been suspicious of Orientals, considering them untrustworthy and unreliable. As China has come into its own, the popular attitude has developed into a mixture of fascination and growing anxiety. This anxiety appears to have increased as the rift between Moscow and Peking has deepened, expressing itself in the reality of public polemics and the possibility of military conflict.

Like other European peoples who fought World War II on their home ground, the Soviet people are anxious for their leaders to avoid war. In contrast to its earlier touting of the ideological premise of a hostile capitalist world, full of oppressed workers waiting impatiently to be liberated and set on the path of communism, the regime now prefers to present itself to the world and its own people as the leading exponent of peace and the creator of a peace bloc among nations. The Soviet people have responded to this propaganda line more positively than to ideological messianism, and it would

be difficult for the regime to whip up enthusiasm for an openly aggressive war. In view of the vivid memories of the last war's terrible suffering and privation, as well as evidence of collaboration between some of the minority peoples and the enemy, there is even some question whether tried-and-true appeals along the line of "the motherland in danger" or "the yellow peril" would evoke a uniformly favorable response.

D. Manpower, labor conditions, and labor relations

1. Labor force

According to the 1970 census the manpower resources of the U.S.S.R., defined as the total population age 16 and over, comprised approximately 167,010,000 persons, or 69.1% of the total population of 241,720,000. Of the total manpower resources in 1970, about 129,104,000 persons, or 77.3%, were in the labor force. Another 1,383,000 persons, or .8%, represented a labor reserve, including such persons of working age as students and females with children, which would be available in an emergency. The remaining 21.9% was made up of persons not of working age, such as persons of retirement age, defined as over 59 for males and over 54 for females, who could be called on to augment the labor force in an emergency.

Soviet labor force figures are not conceptually comparable with U.S. figures and are not a valid measure of labor input. The labor force numbers exceed the annual average employment figures by substantial amounts, and the two series represent quite different concepts. The labor force can be said to include not only the steadily employed but also persons who move in and out of the labor force on the basis of particular job opportunities. Many of the latter are probably quite accustomed to working during certain seasons and do not look for work in others. Presumably, if year-round employment were offered with attractive remuneration, most of the persons denoted as being in the labor force would work a full year. Thus, it would be a mistake to subtract annual average employment figures from the labor force figures and call the difference unemployment, as defined in the United States, because this difference does not necessarily represent those who are

looking for work but are unable to find it. This presumption is supported by the fact that the difference between the annual average employment number and the labor force total has decreased substantially during the years 1926-70 and appears likely to continue as the economy becomes more complex and offers more workers an alternative to seasonal employment. Whatever else the labor force and the annual average employment figure represents, it can serve as an index of labor utilization. Figure 59 details the estimated and projected development of the Soviet Union's total population, manpower resources, labor force, and civilian employment from 1950 to 1975.

Persons of working age, officially defined in the U.S.S.R. as 16 through 59 for males and 16 through 54 for females, constituted in 1959 almost 90% of the labor force, and persons above the officially defined working age almost 10%. The number of juveniles under 16 in the labor force, according to the 1959 data, was less than 1%—only 636,000 persons. This number, however, apparently included only persons under 16 years who had dropped out of school and were working full time. A large majority of students 12 through 15 years of age—perhaps as many as 4 million—work for pay at collective and state farms during their summer vacations. Figure 60 provides the estimated and projected breakdown of the labor force by age and sex in 1959 and 1970.

The demographic effects of World War II on the U.S.S.R.'s manpower resources continue to manifest themselves. The Soviet Union's military losses during that war, estimated to be 10 million males, increased the percentage of women in the working-age group from 51.1% in 1939 to 54.0% in 1959. It is estimated that in 1970 the percentage of women in the working-age group dropped back to 51.1%. The proportion of retired women is increasing, however, as the age groups affected by male losses during World War II move into these brackets.

To compensate for the relative shortage of males, the U.S.S.R. has had to employ a larger proportion of its female population than before World War II. The low birth rates of World War II, which reduced the number of persons reaching working age during the late 1950's and early 1960's, forced the regime to intensify its

FIGURE 59. ESTIMATED AND PROJECTED MANPOWER RESOURCES, LABOR FORCE, AND CIVILIAN EMPLOYMENT, 1950-75

(Data from U.S. Dept. of Commerce; all figures in thousands)

	1950	1955	1959	1965	1970	1975
Total population.....	178,519	194,389	208,827	229,600	241,720	253,363
Manpower resources.....	129,708	145,192	149,711	164,441	167,010	195,947
Labor force.....	97,005	105,211	109,181	119,906	129,104	141,418
Armed forces.....	4,600	5,800	3,600	3,000	3,300	3,000
Civilian labor force.....	92,405	99,411	105,581	116,906	125,804	138,418
Nonagricultural sectors.....	42,474	49,539	57,587	73,386	86,091	99,484
Agricultural sectors.....	49,931	49,872	47,994	43,520	39,713	38,934
Civilian employment (annual average)...	79,894	87,218	93,912	107,852	119,211	133,029
Nonagricultural sectors.....	36,958	44,023	52,071	67,751	80,721	96,150
Agricultural sectors.....	42,936	43,195	41,841	40,101	38,490	36,879

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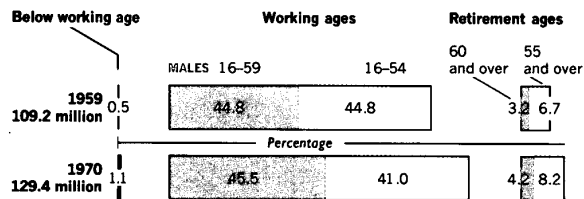


FIGURE 60. Labor force by age and sex, 1959 and 1970

FIGURE 61. PERCENTAGE OF WOMEN WAGE AND SALARY EARNERS, BY SECTOR OF THE ECONOMY, 1928-69*

SECTOR	1928	1940	1950	1960	1969
Total	24	39	47	47	50.5
Industry (industrial production personnel)	26	38	46	45	48
Construction (construction installation personnel)	6	23	33	29	27
Agriculture	24	30	42	41	42
State and industrial enterprise farms	45	34	49	43	43
Transportation	7	21	28	24	24
Communications	28	48	59	64	67
Housing and communal services	19	44	57	66	75
Trade, procurement, supply and sales, and public dining	22	43	54	53	51
Health services	63	76	84	85	85
Educational and cultural institutions	55	59	69	70	72
Science and scientific services	40	42	43	42	47
Credit and insurance	38	41	58	68	77
Administrative organizations (state and cooperative institutions)	19	34	43	51	60

*Excludes the self-employed; includes wage and salary earners on collective farms, but not collective farmers who share in net farm income.

efforts to induce housewives into the labor force. Because the participation rate of females already was high, however, these efforts met with relatively little success. Figure 61 illustrates the share of women wage and salary earners in the various sectors of the economy since the beginning of the First Five Year Plan in 1928.

Labor force growth was additionally spurred during the late 1950's and early 1960's by basic changes in the educational system emphasizing work-study programs in secondary schools and higher educational institutions. The participation of adolescents in the labor force also rose during the late 1950's as a result of a campaign against such "parasites" as school dropouts who failed to take jobs. Another factor in the growth of the civilian labor force was the reduction in the size of the armed forces in the mid-1950's. By the mid-1960's the rate of increase of the working-age population had once again turned upward, reaching a level apparently adequate for sustained labor force growth, but the declining birth rate of the 1960's portends a marked slowdown in annual increments in the late 1970's.

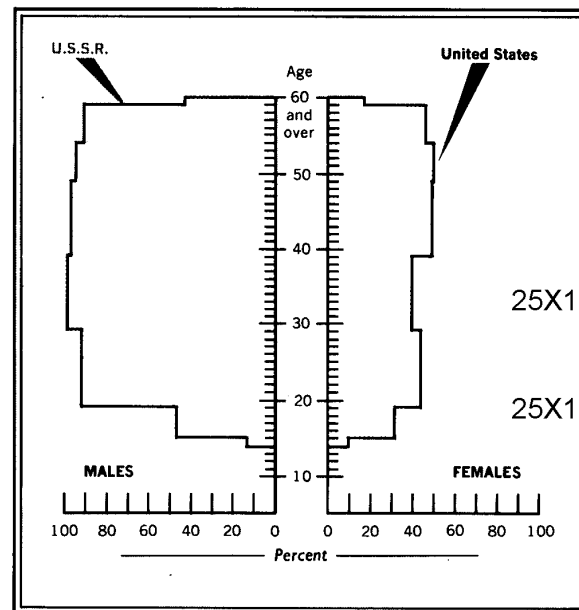


FIGURE 62. Comparative labor force participation rates by age and sex, the U.S.S.R. and the United States, 1965

In 1959 the Soviet labor force of 109,181,000 represented 52.3% of the total population; it included 55.7% of the total male population and 49.4% of the total females. The 1970 estimated labor force figure of 129,104,000 represented 53.4% of the population. As Figure 62 demonstrates, the labor force participation rate for Soviet males is comparable to that of the United States, but the rate for females is nearly twice as high.

The Soviet Union since 1928 has achieved a relatively rapid industrialization of its economy. This is reflected in official Soviet statistics detailing the percentage distribution of the civilian labor force by sector of the economy, as shown in Figure 63. The distribution of various occupations by branch of activity has been analyzed only in the 1959 census, and the categories used do not conform to international usage. Figure 64, however, reproduces a breakdown made by the Organization for Economic Cooperation and Development (OECD) in an attempt to standardize these categories.

The Soviet Union's practice in analyzing its labor force is to categorize the largest part as "wage and salary earners"—87.9 million persons in 1969, or 78.41% of the total—while the remainder are divided between the class of "collective farmers and craftsmen in cooperatives" (21.56%), and the class of individual farmers and craftsmen (0.03%). Collective farmers and craftsmen are not considered wage or salary earners, because they share in the net profits of their collective farms or cooperatives. Thus, while 29% of the country's civilian labor force was engaged in agriculture and forestry in 1969, only 10% of the country's wage and salary earners were so engaged. The number of wage and salary earners increased nearly sevenfold from 1913

FIGURE 63. PERCENTAGE DISTRIBUTION OF THE CIVILIAN LABOR FORCE BY
SECTOR OF THE ECONOMY, 1913-69

SECTOR	1913	1928	1940	1950	1960	1969
Industry and construction	9	8	23	27	32	36
Agriculture and forestry	75	80	54	48	39	29
Transportation and communications	2	2	5	5	7	8
Trade, procurement, supply and sales, and public dining	9	3	5	5	6	7
Health services, education, science and culture	1	2	6	8	11	15
Administrative organizations and credit and insurance	4	5	3	3	2	2
Others, including housing and communal services			4	4	3	3
Total	100	100	100	100	100	100

*Includes wage and salary earners, collective farmers, workers in industrial cooperatives, and some self-employed persons (chiefly craftsmen and farmers).

FIGURE 64. OCCUPATION BY BRANCH OF ECONOMIC ACTIVITY, 1959
(Data from OECD; all figures in thousands)

OCCUPATION	AGRICULTURE	MINING AND MANUFACTURING	CONSTRUCTION	COMMERCE	TRANSPORTATION AND COMMUNICATION	SERVICES	ACTIVITY NOT ADEQUATELY DESCRIBED	TOTAL
Professional, technical, and related workers	479.7	981.6	324.9	150.8	198.5	5,960.0	289.9	8,385.4
Administrative, executive, and managerial workers .....	...	450.7	87.2	381.0	101.6	612.2	220.9	1,853.6
Clerical workers	872.7	1,057.3	203.3	600.2	396.5	1,021.3	87.8	4,239.1
Sales workers	66.2	227.0	47.4	1,482.6	34.9	76.5	87.7	2,022.3
Farmers and related workers	34,377.5	204.6	77.1	64.9	38.8	143.5	232.5	35,138.9
Miners, quarrymen, and related workers .....	...	983.9	69.2	...	...	98.0	36.0	1,187.1
Transportation and communication workers	1,592.3	2,299.9	614.5	516.6	3,273.3	372.8	352.8	9,022.2
Craftsmen, production process workers, etc.	1,756.1	15,033.9	4,657.0	373.4	1,267.6	1,281.1	13.0	24,382.1
Service, sport and recreation workers ..	19.1	994.8	212.1	1,056.2	277.9	3,606.9	789.1	6,956.1
Workers not classified by occupation ...	243.7	983.0	544.6	257.9	148.4	145.0	135.3	2,457.9
Total	39,407.3	23,216.7	6,837.3	4,883.6	5,737.5	13,317.3	2,245.0	95,644.7

... Not pertinent.

to 1969, while the population increased approximately 50%. The largest annual increases in the number of wage and salary earners occurred during the First Five Year Plan, averaging 20.6% annually. Thereafter, average annual increases fluctuated between 7.2%, immediately following World War II, and 3.2% in 1969. Significant above-average increases occurred from 1928 to 1967 in the sectors of science, highway and urban transportation, housing, communications, health services, trade and public dining, and education. At the same time, the size of the work force in the collective farm sector has steadily declined, both in absolute and in relative terms. The average number of persons employed by collective farms, state farms, and auxiliary agricultural enterprises had shrunk to 26.3 million in 1969. Of these, 17.2 million were on collective farms and 9.1 million on state farms and auxiliary agricultural enterprises.

A significant number of persons in the "wage and salary earners" class—29.9 million in 1969—are

engaged in "mental work." The "mental workers" include persons employed in white-collar occupations, such as managers, officials, technical specialists, sales and restaurant personnel, security forces, secretaries and clerks, and other persons in the service occupations. Changes in employment between 1941 and 1968 in a selected number of these occupations and the proportion of women "specialists" in 1968 are shown in Figure 65. Not mentioned in Soviet statistical yearbooks is the fact that nearly half of all "specialists" are employed in occupations other than those for which they were trained in the higher and secondary schools. The graduates of these schools have preferred accepting any kind of job in their hometowns or in larger cities which offer better living conditions, rather than work at their specialties in the hinterland, including Siberia and the Far North.

A category above "specialists with higher and secondary training" is the class of "scientific workers,"

FIGURE 65. SPECIALISTS WITH HIGHER AND SECONDARY SCHOOL TRAINING*
EMPLOYED IN THE ECONOMY, 1941-68

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CATEGORY	1941	1955	1968	PERCENT FEMALE
----- Thousands -----				
All specialists.....	2,401	5,133	14,956	58
Specialists with higher training.....	909	2,184	6,042	52
Of which:				
Engineers.....	295	598	2,168	31
Agronomists, livestock specialists, and veterinarians.....	65	147	360	40
Economists.....	57	105	410	64
Commodity specialists.....	2	9	51	na
Lawyers.....	21	47	99	na
Physicians (excluding dentists with secondary school medical training).....	142	299	558	72
Teachers, librarians, and cultural workers.....	300	906	2,190	69
Specialists with secondary school training.....	1,492	2,949	8,914	63
Of which:				
Technicians.....	324	823	3,803	38
Agronomists, livestock specialists, and veterinary workers..	89	237	548	48
Planning and statistical workers.....	31	153	786	73
Commodity specialists.....	5	33	325	na
Lawyers.....	6	23	19	na
Medical workers (including dentists with secondary school training).....	393	731	1,688	93
Teachers, librarians, and cultural workers.....	536	819	1,411	85

*Secondary school in the Soviet Union corresponds to high school and junior college in the United States; higher education includes professional and technical training above the high school and junior college level.

who are largely persons holding university degrees. In 1969 there were 883,420 such workers, more than half of whom were engaged in engineering and the physical and mathematical sciences. The balance were distributed among the other pure and applied sciences, the social sciences, arts, and letters. When the category of "scientific workers" is compared with the national composition of the total population, the Russians are apparently 24% more heavily represented than their share in the total population; the Georgians are 46% more heavily represented; the Armenians, 40%; and the Jews, 700%. Almost all the other nationalities are underrepresented, increasingly so as one goes up the training scale. Figure 66 provides a comparison between the nationality composition of the population as of 1970 and that of the "specialist" and "scientific workers" categories as of 1966 and 1969, respectively.

The bulk of Soviet industry, agriculture, and population is located in the European part of the U.S.S.R. More than three-fourths of nonagricultural employment, which is represented approximately by the wage and salary earners category, and of agricultural employment, which is represented largely by the collective farmer category, is concentrated in the European regions of the U.S.S.R.

The most important development in the geographical distribution of manpower has been the eastward movement that began in the 1930's. Movement of population to the ore and coal deposits of the Urals and western Siberia and the oilfields of the southeast was a claimed accomplishment of the First Five Year Plan, and further eastward and northward movement has

been a feature of all subsequent Soviet plans. In general the eastward movement has not been spontaneous; it has required continual prodding by the government. In some periods the government has had to resort to special incentives, appeals to patriotism, and the imposition of quotas to obtain the required number of migrants. Despite these measures there has always been a large backwash of migrants to their former, more congenial residences in the west. Wartime evacuation to the Urals and areas east of the Urals was responsible for important additions to both the population and the labor force of these regions, the population increasing by nearly 10 million between 1939 and 1959. Since that time, however, the growth of these regions has not been significantly greater than that of the rest of the country.

Another means of populating the remote areas has been through forced labor. At the beginning of 1953 an estimated 5 million prisoners were confined in camps scattered throughout the U.S.S.R., with large clusters of camps located in central Siberia, the Far North, and the Far East. The prisoners were employed mainly in construction, logging, and mining activities, and even with the great waste inherent in forced labor, the prisoners' efforts contributed significantly to the economy. After the death of Stalin, Soviet authorities acknowledged that, whatever its benefits, the costs of forced labor were too great to be borne in a complex industrial society, and through amnesties and penal reforms they greatly reduced the number of prison inmates as well as the number of prisons. Most prison camps were renamed "corrective labor colonies," which, according to Soviet claims, emphasized

FIGURE 66. NATIONALITY COMPOSITION OF TOTAL POPULATION, "SPECIALISTS," AND "SCIENTIFIC WORKERS," BY PERCENT

NATIONALITY	TOTAL POPULATION 1970	"SPECIALISTS" 1966	"SCIENTIFIC WORKERS" 1969
Russian.....	53.4	62.5	66.1
Ukrainian.....	16.9	15.6	10.8
Belorussian.....	3.7	3.1	2.0
Uzbek.....	3.8	1.4	1.3
Tatar.....	*2.5	1.6	1.2
Kazakh.....	2.2	1.0	0.8
Azerbaidzhani.....	1.8	1.2	1.4
Armenian.....	1.5	1.4	2.1
Georgian.....	1.3	1.7	1.9
Lithuanian.....	1.1	0.9	0.8
Jewish.....	0.9	3.8	7.2
Moldavian.....	**1.2	0.4	0.3
Chuvash.....	0.7	0.3	0.2
Latvian.....	0.6	0.7	0.7
Tadzhik.....	0.9	0.3	0.2
Mordvin.....	0.5	0.2	0.1
Turkmen.....	0.6	0.3	0.2
Bashkir.....	0.5	0.2	0.1
Estonian.....	0.4	0.5	0.5
Kirgiz.....	0.6	0.2	0.2
Others.....	4.9	2.7	1.9
Total.....	100.0	100.0	100.0

*Includes both Volga Tatars and Crimean Tatars.

**Includes persons classified as Romanian.

reeducation toward resumption of a normal, productive life. In recent years underground publications have reported a partial reversal of this trend with the opening of new prison camps in western areas of the U.S.S.R. Forced labor is presently concentrated in the mining and lumbering industries. Although its scope has been much reduced from Stalin's time, the present forced-labor population is estimated to be between 500,000 and 1,000,000; it probably does not contribute significantly to the economy. No official statistics are available on the extent of forced labor in the U.S.S.R.

The Soviet Union neither compiles nor publishes statistics on unemployment. Their absence is consistent with the official position of the Soviet Government that unemployment was abolished in 1930. A basic tenet of Soviet policy is the principle, "He who does not work, neither shall he eat." The government has deliberately sought to employ as large a portion of its working-age population as possible by making it extremely difficult for able-bodied persons to remain outside the labor force and by facilitating the entry of new workers. Workers have the right to leave their places of employment voluntarily after giving 2 weeks' notice, but they lose their term of continuous service if they do not take another job within 30 days, an important consideration in determining welfare benefits. Too frequent job changes may be considered absenteeism. Workers between jobs receive no public assistance, as there is no provision for unemployment benefits. Despite these incentives to employment, there remains a residuum of unemployment—a fact which the

government indirectly acknowledged in 1967 when it set up labor commissions in various cities to serve as labor exchanges and help "redeploy the nation's manpower resources more efficiently."

2. Wages, hours, and working conditions

The direction of manpower constitutes an important aspect of the Soviet planned economy. Successful implementation of the national economic plan is the goal of Soviet manpower planning, which extends to all segments of the labor force. The number of workers not directly affected by such manpower planning is negligible, since the only employers are state-owned enterprises and institutions, collective farms, and other "cooperative" enterprises. Planning and control are exercised by centralized governmental authorities, the State Planning Committee (*Gosplan*), and the State Committee for Labor and Wages. The civilian manpower plan allocates human resources, sets productivity goals consistent with the requirements of the production plan, and provides for the training of new cadres. The allocation of manpower may be effected directly through obligatory work assignments and transfers and restrictions on the mobility of labor; it is increasingly effected indirectly through such measures as wage differentials and other inducements designed to attract workers to priority segments of the economy.

In 1969 the monthly cash earnings of all wage and salary earners averaged 117 rubles, more than double the 47.5 rubles of the first postwar year, 1946. While average monthly earnings have risen steadily throughout the postwar years, prices of consumer goods have tended to remain relatively stable. Real earnings of wage and salary earners have thus increased 108% from 1950 to 1969. Figure 67 depicts average monthly cash earnings of wage and salary earners for selected years between 1940 and 1969 by economic sector.

The majority of wage earners are paid according to piecework. The proportion of those who are has fluctuated, however, rising in industry, for example,

FIGURE 67. AVERAGE MONTHLY RUBLE EARNINGS OF WAGE AND SALARY EARNERS BY ECONOMIC SECTOR,*

ECONOMIC SECTOR	1940-69			
	1940	1950	1960	1969
All sectors.....	33.1	64.2	80.6	116.9
Industry.....	34.1	70.8	91.6	127.7
Construction.....	34.0	60.5	92.4	139.9
State and industrial enterprise farms..	22.0	38.3	53.8	93.2
Transportation.....	34.8	70.7	87.0	131.3
Communications.....	28.2	52.9	62.7	93.5
Trade, supplies, restaurants.....	25.0	47.0	58.9	92.9
Housing and communal services.....	26.1	49.2	57.7	91.3
Health services.....	25.5	48.6	58.9	91.1
Education and culture.....	32.3	66.8	69.9	103.9
Science and scientific services.....	47.1	93.7	105.3	132.6
Credit and insurance.....	33.4	66.8	70.7	106.8
State and cooperative institutions...	39.0	68.8	86.4	119.7

*Includes wage and salary earners on collective farms, but not collective farmers who share in net farm income.

25X1

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from 58% in 1928 to 76% in 1936, holding steady at that level until 1954 and then dropping to 58% in 1965. The wages of workers and employees are further differentiated according to a system of job classifications that seeks to account for differences in skill, the difficulty of the job, and the importance to the economy of the particular industry. Jobs are divided into a number of wage grades representing increasing levels of skill and monetary compensation. The wage rate of the first grade in each occupation is fixed for each industry by the State Committee for Labor and Wages. Because the differential between the first and last grades is fixed, the range of pay thus becomes established. In 1968 the minimum monthly wage in all sectors of the economy was raised from 40 rubles to 60, fulfilling the minimum wage goal set by the 1966-70 Five Year Plan.

In addition to wages and salaries, workers receive a variety of social welfare benefits, notably social insurance, medical care, and education. Rents in state-owned housing are heavily subsidized and cost the worker only 5% to 6% of his total earnings. Soviet sources claim that budget-financed social benefits, including free education, amounted in 1969 to an average monthly supplement of 41 rubles to the national average monthly income of 117.

Improvement of working conditions has not kept pace with industrialization in the U.S.S.R. Although extensive legislation regulating working conditions was enacted to meet changing circumstances not foreseen by the comprehensive Labor Code of 1922, the entire corpus of labor law was largely ignored throughout the early 5-year plans and especially during World War II and the immediate postwar period. Only after the death of Stalin did concern for increased labor productivity result in stricter observance of existing laws and the introduction of new legislation. In 1970 a new Labor Code was enacted incorporating many of the changes introduced in the post-Stalin period and completely superseding the 1922 Code.

During 1967 the 5-day workweek gradually replaced the 6-day workweek for most wage and salary earners. The number of working hours per week for most workers, however, remained unchanged at 41. The number of working hours per day thus was increased from about 7 to about 8. The system of 5 workdays with 2 successive days of leisure constitutes a major change for the Soviet worker. One of the first basic changes made by the new Soviet state in 1917 was the establishment of the 8-hour workday and the 6-day workweek. The 6-day workweek remained constant for the next 50 years, except for a short experimental period from 1929 to 1931.

The length of the workday in the Soviet period has fluctuated between 7 and 8 hours. Gradually most workers were placed on a 7-hour workday during the 1929-33 period. During World War II the 8-hour workday was decreed as a defense measure, remaining in effect until 1960, when the 7-hour workday was fully reinstated. For workers in occupations specified by law as being arduous and hazardous, for young workers

between 16 and 18, and for certain other groups such as teachers and doctors, the standard workday is 1 hour shorter than for the bulk of the wage and salary earners. The average workweek in all branches of industry in 1969 was 40.7 hours, down from 47.8 hours in 1955 and 58.5 hours in 1913; if all wage and salary earners, including young workers and professional people, are taken into account, the average workweek in 1969 was 39.4 hours.

Overtime is forbidden under Soviet law without prior authorization by trade union and public authorities. Overtime work is permitted only in special or urgent circumstances stipulated in the Labor Code, each worker being limited in theory to 120 hours of overtime annually. A maximum of 4 hours within 2 consecutive days is allowed, with time and a half paid for the ninth and tenth hours and doubletime for all hours in excess of 10. Workers under 18 years of age, certain partial invalids, and expectant or nursing mothers are exempt from overtime labor. Refusal to work overtime when such work is considered critical is a punishable breach of labor discipline. If the worker believes that management's request for overtime is unreasonable, he may appeal to his enterprise trade union committee, to the enterprise's labor protection commission, or to the public labor health inspector.

Eight legal holidays are observed: New Year's Day (1 January), International Women's Day (8 March), International Labor Days (1 and 2 May), World War II Victory Day (9 May), Anniversary of the 1917 Revolution (7 and 8 November), and Constitution Day (5 December). If a worker's day of rest coincides with a holiday, he is not entitled to another day of rest. As of 1968 the minimum annual vacation was increased from 12 to 15 working days. Since, by Soviet definition, Saturday is still counted as a working day, the worker who is entitled to a minimum vacation actually gets only 13 of his working days off a year. The length of a wage or salary earner's paid annual vacation varies from 15 to 48 workdays, with the average length 20.9. Those receiving the longer holidays are minors, holders of hazardous or arduous jobs, workers in the Far North, or employees in the scientific and educational professions. In mid-1968, the distribution of wage and salary earners by the number of workdays of vacation they received was as follows:

WORKDAYS OF PAID ANNUAL VACATION	PERCENT OF WAGE AND SALARY EARNERS
15	40.0
18	17.5
21	5.3
24	23.3
More than 24	13.9

Labor legislation concerning the conditions of work for women and children is extensive, but for a considerable period of time it was not enforced. The 1922 Labor Code forbade, for example, the employment of women in underground work, but only in 1957 did a new decree enforce this provision. The present Labor Code further stipulates that women and youths are not

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FIGURE 68. SOVIET TRADE UNIONS

NAME OF UNION	FOUNDED	MEMBERSHIP (1967)
Agriculture and (Agricultural) Procurement Workers.....	1953	13,864,000
Aviation and Defense Industry Workers.....	1957	na
Aviation Workers.....	1937	na
Coal Industry Workers.....	1920	2,500,000 (1960)
Communications Workers.....	1957	na
Construction and Building Materials Industry Workers....	1958	5,600,000
Cultural Workers.....	1953	1,560,000
Education, Higher Schools, and Scientific Institutions Workers.....	1957	6,150,200
Electric Power Station and Electrical Industry Workers..	1953	2,341,900
Food Industry Workers.....	1917	3,187,000
Geological Survey Workers....	1934	na
Local Industry and Municipal Public Service Workers.....	1945	4,398,000
Machine Building Workers....	1953	na
Maritime and River Fleet Workers.....	1953	650,000 (1964)
Medical Workers.....	1949	4,857,600
Metallurgical Industry Workers.	1957	3,000,000 (1959)
Motor Transport and Highway Workers.....	1968	na
Petroleum and Chemical Industry Workers.....	1957	na
Radio and Electronics Industry Workers.....	1965	na
Railway Transport Workers...	1917	3,917,800
Shipbuilding Industry Workers..	1965	na
State Institutions Workers....	1918	2,335,000
Textile and Light Industry Workers.....	1953	3,510,000
Timber, Paper, and Wood-working Industry Workers...	1953	2,946,500
State Trade and Consumer Cooperative Workers.....	1957	5,031,500

na Data not available.

to be employed in arduous or hazardous work, and they are not allowed to do nightwork. Pregnant women receive special benefits in the form of pregnancy leave, amounting to 112 calendar days for normal birth and a longer period when the childbirth is abnormal. In addition, nursing mothers are given the necessary time off, and pregnant women are transferred when necessary to lighter work at their former rate of pay. Soviet law stipulates that the basic minimum working age is 16 years, but youths of 15 may be hired in exceptional cases with the approval of the enterprise trade union committee. Youths of 12 to 15 are used widely, moreover, in collective farming, to which the law does not apply.

Under the Labor Code all enterprises are responsible for providing safe and hygienic working conditions. Management is required to provide without cost special protective and medical equipment and supplies for workers exposed to extremes of temperature or humidity or to possible toxic effects or other hazardous environmental conditions. Laws and rules governing safety and hygienic working conditions are drafted by the State Committee for Labor and Wages, the Ministry of Health, and the All-Union Central Council of Trade Unions, and are enforced both through a system of inspectorates under the guidance of these organizations and through the public procurator's office.

3. Labor organizations

A trade union movement, in the sense that workers freely choose representatives to pursue worker goals, does not exist in the Soviet Union. The central government wields absolute control over wages, hours, and working conditions, as well as over the social insurance system. Nevertheless, at the beginning of 1968 about 86.1 million workers and employees, or approximately 96.3% of those eligible, were reported to be members of trade unions in the U.S.S.R. Remaining outside the trade unions are the collective farmers, who constitute more than one-fifth of the labor force but are not eligible for membership because they are members of cooperatives.

Soviet trade unions are organized along industrial rather than craft lines. Both wage and salary workers, blue collar and white collar, are union members. Figure 68 lists the 25 trade unions functioning in 1970. Although membership in a union is not obligatory, the welfare benefits granted members promote a high percentage of participation. Trade union members receive sickness benefits double those paid to nonmembers, and disability benefits also are higher. In addition, members receive some priority in housing and in obtaining passes to health resorts and sanatoriums. Children of members have priority in being accepted in nurseries and summer camps. In addition, mutual aid funds for loans, free legal counsel, libraries, and recreational activities and clubs are available to union members. Union dues range from 0.5% to 1% of earnings, the higher rate applicable to earnings above 70 rubles a month.

The primary unit of the union's administrative structure is the enterprise trade union committee, nominally elected by a general meeting of the membership in any enterprise institution or economic unit with 15 or more union members. In fact, however, these elections frequently are dominated by the factory officials, and the committee always takes its orders and instructions from the trade union hierarchy, the party, and management rather than from the union membership.

Local trade union organizations send representatives to regional, republic, and national conferences. The national conference or congress of any given trade union represents in theory the highest authority for that union. Each of the regional, republic, and national conferences in turn elects a trade union central committee as the administrative organ in between conference meetings. The regional and republic trade union conferences of the various unions also elect representatives to interunion councils to coordinate labor matters at their respective levels.

The national conferences or congresses of the various unions also send representatives to the All-Union Trade Union Congress, which in turn elects the All-Union Central Council of Trade Unions (AUCCTU). The AUCCTU, which had 304 members as of 1968, elects a presidium (27 members in 1968) and a chairman. The head of the Soviet labor movement since 1967 has been A. N. Shelepin. Figure 69 depicts the Soviet trade union structure. The All-Union Trade Union Congress in theory meets every 4 years, but in fact the intervals have been longer, the maximum being 17 years between the ninth congress in 1932 and the tenth in 1949. The most recent congress was the 14th, held in 1968. Between congresses the AUCCTU implements the policies adopted by the last congress, exercises control over all trade union organizations and activities through inspectors and professional union organizers, and collaborates with the government on matters affecting labor. Party control is exercised through party members attached to all of the union bodies and concentrated particularly in the higher levels of the trade union structure.

In general the organizational structure of the labor unions corresponds to the structure of the Communist

Party, and changes in the latter usually are followed by similar changes in the former. Thus, after the party apparatus was divided in late 1962 into separate organizations to control industry and agriculture, the AUCCTU announced that separate bureaus for industry and agriculture would be created in the various interunion councils at all levels. After the removal of Khrushchev from office in 1964, the party restored its pre-1962 structure, and almost immediately thereafter the trade unions did likewise.

Labor unions in the Soviet Union are set up on the general premise that the workers own the means of production and regulate the distribution of goods. Because of the workers' alleged identity of interest with the state, the unions' primary functions are to insure fulfillment of the economic plan and to raise productivity as a means of improving the workers' economic status. Inasmuch as wages and conditions of work are determined by law or administrative procedure, the trade unions' guardianship of the workers' interest is confined mainly to protecting them against any infractions of established regulations and agreements by management. An ever greater share of the unions' energies, however, is expended to protect management against infractions of labor discipline by the workers.

The enterprise trade union committee is given the nominal right to participate in drawing up the enterprise's production plan and in deciding the norms and organization of wage payments. Production conferences which bring together representatives of labor, management, and other interested parties create the illusion of a role for labor in the control of production. As trade union activities are oriented to increasing production, one of their main responsibilities has been to take the lead in planning and encouraging various forms of socialist competition and emulation among workers.

The fact that Soviet trade unions do not function as protectors of labor in the Western sense does not mean that they are without importance. They play a vital role in bending workers to the goals of the regime and may be considered among the many organizations making up the vast, intricate propaganda machine directed by the Communist Party. The unions publish 10 major newspapers, most of which are sponsored jointly by individual industrial unions and the corresponding ministries or central boards. The largest, however, are sponsored directly by the AUCCTU, and in terms of circulation are among the largest newspapers of the U.S.S.R.—*Trud* (Labor), with a circulation of 3.5 million in 1969, and *Sovetskiy Sport* (Soviet Sport), with a circulation of 2.7 million in 1968. In addition, the unions publish 11 mass-circulation magazines, the most important of which are *Sovetskiye Profsoiuzy* (Soviet Trade Unions), *Sovetskaya Zhenshchina* (Soviet Woman), and *Novoye Vremya* (New Times); the latter two contain significant political commentary at 25X1 issued in multilingual editions.

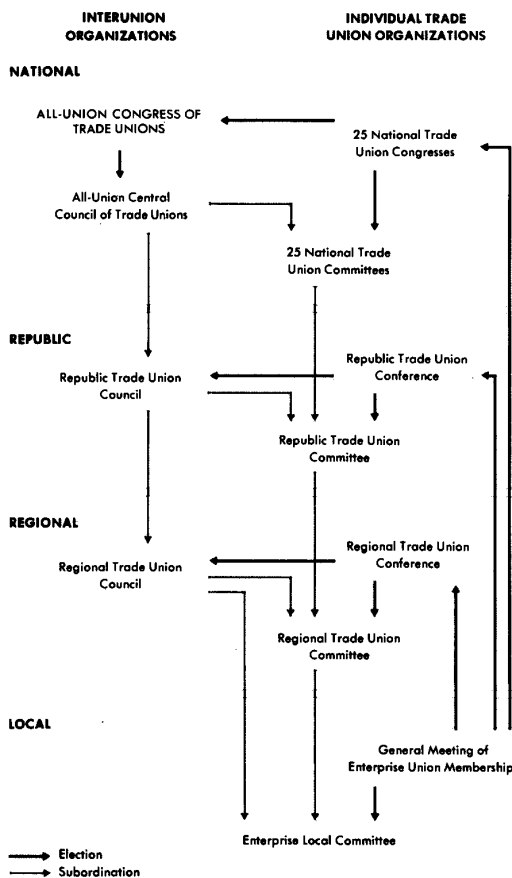


FIGURE 69. Trade union structure

Soviet trade unions are also entrusted with certain functions which normally are governmental activities in Western nations. Thus, they administer most of the welfare programs directly affecting labor. The largest of these is the social insurance program, which includes pensions, disability and maternity benefits, resorts and rest homes, and facilities for the care of members' children. The trade union system maintains an elaborate administrative apparatus for these benefits, including social insurance stewards in the trade union groups, factory social insurance commissions, and a department of social insurance under the AUCCTU. Though nominally independent, the trade unions have in fact become a surrogate ministry of labor and are an active instrument of governmental and party policy. Illustrative of this is the fact that key decrees affecting such policies as the length of the workweek have been signed by the Communist Party Central Committee, the Council of Ministers of the U.S.S.R., and the AUCCTU.

4. Labor-management relations

The relationship between management and labor in the U.S.S.R. is essentially governed by two factors: both groups are in the employ of the state, and each operates in a field closely regulated by the central authorities. Management must obey the laws and directives governing wages, hours, sick leave and vacations, dismissal, transfer, and various other details of day-to-day relationships with the workers. The trade unions, in turn, act to some extent as a check on management to assure that their members are treated in accordance with the laws. Collective agreements between management and labor state in detail how the laws and directives of the central authorities are to be implemented at the individual enterprises. Labor disputes arise primarily when management is accused by labor of either violating or misinterpreting the law or the terms of the collective agreements.

The collective agreement in the U.S.S.R. in no sense represents collective bargaining as practiced in the West. The annual collective agreement is used primarily as a means of applying national policy at the enterprise level. About 100,000 agreements are concluded annually between trade union locals and the management of the respective enterprises. Only a fraction of all enterprises are affected, however; most employers prefer carrying forward existing agreements to taking the time to negotiate new ones each year.

Collective agreements stress the importance of fulfilling planned output and productivity goals. Following a general statement about labor and management obligations, there are sections dealing with the established wage scales, with the organization and conditions of work, including provision for safety measures, with labor discipline, and with plans for housing, social welfare, and cultural facilities. The collective agreement does not determine the wage rate but specifies only the obligation of the employer to adhere to the official scales. In the agreement, management and the union jointly assume responsi-

bility for adjusting norms in response to changing technology and increasing productivity. In enterprises adopting the new system of planning under the 1965 economic reform, the collective agreement has become the instrument of planning. It specifies production, cost, and other indexes to be achieved and the means to accomplish these goals.

In the U.S.S.R. today there is no provision for labor-management disputes as understood by Americans. Working conditions, hours and wage rates, and salaries, the dominant concerns of most Western trade unions, are set by law. Strikes and lockouts, though not explicitly prohibited by law, are branded by the regime as "counterrevolutionary"—i.e., antistate and antiparty activity—and are swiftly suppressed. Although the more punitive labor laws have been revoked since 1953, there remain measures to insure discipline among workers, with penalties of up to 3 years' imprisonment for organizing or taking part in "group actions" impeding the operation of state and public institutions or enterprises. Unauthorized absenteeism is subject to administrative disciplinary measures at the discretion of management. Nonetheless, sporadic, localized strikes and riots have occurred during the past decade, but they have been quickly suppressed and never officially admitted.

Within the various enterprises, however, there are disagreements in such matters as job classification, application of wage scales, overtime pay, vacations, time lost by work stoppage, layoffs, severance pay, wage payments in connection with transfers, fines imposed for infraction of rules, damage caused by workers and payment therefor, dismissals, and the receipt of authorized benefits. The machinery created to handle such disputes serves to provide the worker with some sense of participation in management and of influence over his working conditions.

Three agencies are involved in the handling of grievances: the joint commission on labor disputes in the enterprise, made up of representatives from the enterprise trade union committee and management; the enterprise trade union committee itself; and the courts. Decisions of the joint commission are supposed to be based on full consideration of the facts and on proper application of law and pertinent regulations or agreements. If the worker bringing a complaint to the joint commission is dissatisfied with the decision, he may appeal to the enterprise trade union committee. The latter body may sustain or change the decision of the joint commission or decide on issues on which the commission was unable to agree. If the worker is still dissatisfied, he may appeal to the court. Management may appeal to the courts only if it feels that the enterprise trade union committee's decision contravenes existing legislation or regulations. The worker is entitled to legal assistance from his union and has no financial costs in connection with his appeal to the courts.

Even with this elaborate machinery, considerable effort is made to reach prompt settlement as close as possible to the source of the dispute. A grievance is not

brought before the joint commission until the worker has tried and failed to get satisfaction directly from management. Often the chairman of the enterprise trade union committee discusses the matter with the foreman or other management representatives and settles the case informally. The great majority of such decisions are accepted and put into effect without appeal, so that decreasing numbers of cases reach the joint commissions, the enterprise trade union committees, or the courts.

E. Health and welfare (U/OU)

1. Levels of living

Although the Soviet Union is rich in resources, much of its population has remained at a relatively low level of living. This seeming anomaly stems from the fact that a large proportion of these resources is allocated to heavy industry and defense. Despite sporadic measures taken by the government to increase the availability of consumer goods, and the doubling of per capita consumption since 1950, the level of living of the ordinary Soviet citizen, even in the most developed urban areas, remains well below that of his counterpart in the United States and in Western Europe north of the Alps and the Pyrenees. Figure 70 compares some indicators of living standards in the Soviet Union and selected other countries. Not included in the comparison are the exceptionally homogeneous Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden), four of which have avoided destructive warfare for more than 150 years and all of whose economies are geared to the acquisition of consumer durables and the

maintenance of an extensive welfare system. Only Sweden spends a sizable portion of its national income on armaments and has significant heavy industry. Taken as a group, the Nordic countries would rank just below the United States in Figure 70.

Within Soviet society there is a wide disparity of standards of living. At one extreme the social and political elite live in relative luxury; at the other the peasant, while better off than ever before in history, remains unable to ameliorate the dreariness and drudgery of his life. This disparity arises from manipulation by the regime of the opportunities for an improved standard of living. Wages and pensions are geared to favor workers in high-priority industries. To reduce labor turnover, social security benefits of most types increase as uninterrupted employment at one enterprise increases. Certain privileges also accrue to individuals who are considered to be of particular value to the regime. More and better housing is available to outstanding workers; automobiles are furnished factory managers and various other executives; free passes are given to resorts as a reward for special performance or responsible position—the resorts varying in quality according to the status of the individuals involved.

Until 1954 the principal means of raising real wages had been to reduce retail prices while holding the line on wage increases. In order to help the lower income groups, the regime changed this policy to one of holding prices fairly constant and raising wages and incomes selectively. Other methods of raising real income have been pension increases, higher state prices for agricultural products, abolition of tuition charges, tax reductions, increases in tax-free allowances, and abolition of compulsory bond purchases.

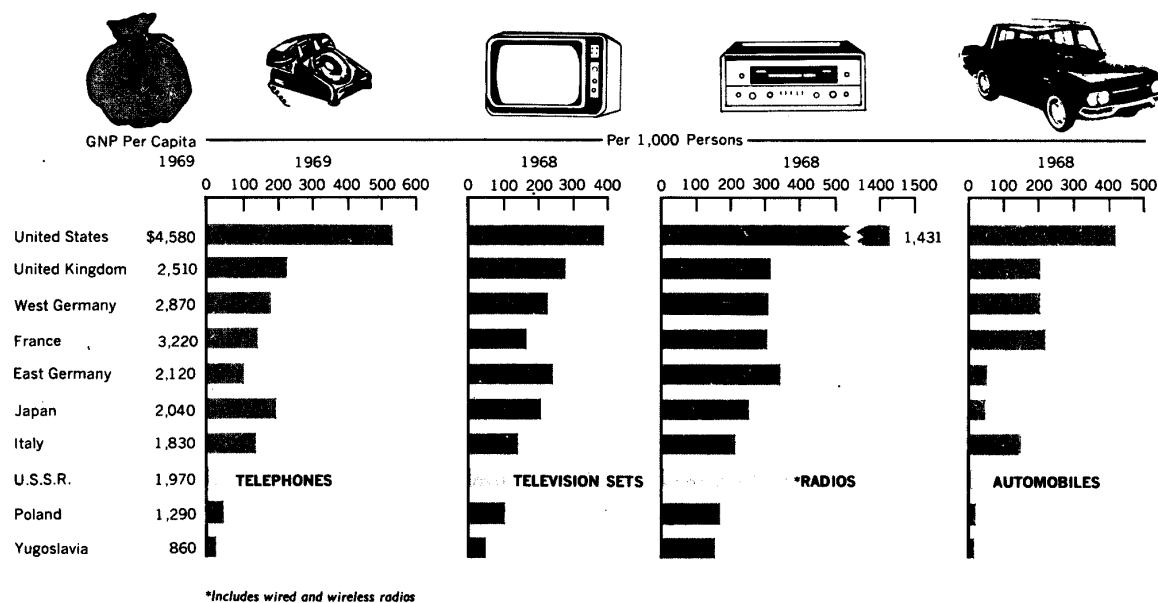


FIGURE 70. Levels of living in the U.S.S.R. and selected countries

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a. DIET—Almost 50% of the average worker's budget is spent for food. The diet consists mainly of starchy items, such as potatoes and bread, while meat, milk, eggs, and fruit are eaten only in limited quantities. Consumption of edible fats and oils is particularly low. Although monotonous by U.S. standards of palatability, the average diet of a Soviet citizen is adequate in food elements, and in terms of calories it is comparable to that in the United States. Despite the government's efforts to maintain basic food requirements, shortages often occur, especially of meat, dairy products, fats, fruits, and vegetables. The demand for these foodstuffs which cannot be met by the state stores is partly satisfied by the relatively high-priced collective farm (*kolkhoz*) markets. The following tabulation shows the estimated average worktime (in minutes) required to purchase selected food items in New York, Paris, Munich, and Moscow in April 1969 (except where otherwise noted, the unit of measurement is 1 kilogram):

CONSUMER ITEM	NEW YORK	PARIS	MUNICH	MOSCOW
Rye bread (unwrapped) . . .	18	38	16	24
Loin of pork	25	204	149	295
Frozen filet of cod	25	83	78	76
Plain chocolate (100-gram bar)	7	10	13	118
Margarine	25	44	43	177
Fresh milk (1 liter)	7	11	11	32
Carrots	8	13	10	59
Eating apples	11	20	21	148
Canned plums	10	32	32	92
Salt (ground)	5	6	32	10
Tea (100 grams)	9	29	45	94
Beer (1 liter)	13	11	18	49

b. CONSUMER GOODS AND SERVICES—The Soviet population is able to buy sufficient clothing for protection from the weather, but the average wardrobe is not large. There is a noticeable tendency for parents to concentrate on clothing the children well, while allowing themselves relatively little. Quality, style, and workmanship are low by West European and American standards but are improving. Many nonessentials, such as leather goods, household appliances, and jewelry, remain out of reach for the average consumer. Installment buying was introduced in 1959 to put certain types of durable goods within the reach of more buyers, but it has yet to play a significant role. In general the homes of Soviet workers are simply and cheaply furnished and contain few, if any, of the items of equipment taken for granted in the United States. Figure 71 outlines the ownership of selected consumer durables in the Soviet Union from 1960 to 1969.

There is still a marked deficiency in consumer services. Cleaning and laundry services are difficult to obtain even in the larger cities. Because there are not enough household repairmen, residents often do their own repairs, and those more capable in this line are able to supplement their income through afterhours work. Beauty shops exist, but their clientele is largely from upper income groups. Barber shops are fairly numerous, however, and their charges are low. In the area of food

FIGURE 71. OWNERSHIP OF SELECTED CONSUMER DURABLES PER THOUSAND POPULATION, 1960-69 (U/OU)

	1960	1965	1968
Watches and clocks.	794	885	935
Radios*	129	165	193
Television sets	22	68	127
Cameras	49	67	76
Bicycles	116	134	144
Motorcycles	10	17	20
Vacuum cleaners	8	18	28
Sewing machines	107	144	157
Refrigerators	10	29	71
Washing machines	13	59	123

*Wireless radios and radiophonographs only.

purchasing and preparation, the regime is making considerable effort to ease household pressures on working women. More prepared foods, canned foods, and food concentrates are being produced, and public catering is being enlarged and improved. The following tabulation shows the estimated average worktime (minutes) required to purchase selected nonfood items and services in New York, Paris, Munich, and Moscow in April 1969:

CONSUMER ITEM	NEW YORK	PARIS	MUNICH	MOSCOW
Cigarettes (20)	9	19	26	15
Aspirin (100)	11	89	84	63
Electric light bulb (100 watts)	7	16	19	43
Toilet soap (1 small bar)	2	14	6	25
Man's raincoat (dacron/cotton)	344	2,488	1,325	5,408
Nylon stockings (1 pair)	14	19	37	196
Laundrying of shirt	5	29	11	21
Man's haircut	46	63	48	39
Baby sitter (1 hour)	34	75	41	98
Small car*	720	1,947	947	5,716
Washing machine (automatic)*	53	281	82	204
Television set (59 cm., black and white)*	57	208	87	695

*Hours of worktime.

c. HOUSING—The lack of adequate housing remains the most difficult aspect of Soviet living. Soviet propaganda places great emphasis on the significant contribution to real incomes in the U.S.S.R. made by the subsidization of housing. As a result of the relatively low level of rent, a Soviet worker spends only 5% to 6% of his budget on housing, as compared with 14% to 18% in Western Europe and 20% to 25% in the United States. In return for this low expenditure, however, he obtains only a small amount of living space and a quality of housing which is poorer than that available in most of Western Europe and far inferior to that available in the United States. Although the basic Soviet sanitary standard is 9 square meters (96.87 square feet) per person, actual per capita living space in 1969 was only 7.3 square meters (75.57 square feet). There is no likelihood that the goal set in 1956 of reaching the basic

standard by 1970 has been attained. In terms of a family of four, the average apartment thus consists of two average-size or three small rooms, not counting the bathroom and kitchen, which in many cases are shared communally.

State-owned housing, consisting largely of apartments, accounted for 69% of the urban housing space at the end of 1969. Such public housing may be divided into three general types: individually occupied apartments, communal apartments, and communal dwellings. The first type, with ample room and all modern conveniences, is restricted largely to individuals deemed most useful to the regime. The second is generally found in older buildings. In such quarters a three-room apartment may be occupied by as many as three families, one family to a room, all using the same kitchen and bath. Most new construction is of the third type, which may be one of three different kinds—multiapartment dwelling, dormitory, or barracks. The multiapartment dwelling has separate apartments; the dormitory is divided into rooms, usually for four persons each; and the barracks is divided into large rooms in which 50 or more persons can be quartered. All types have communal kitchen and bathroom facilities.

The remaining 31% of urban housing at the end of 1969 was privately owned, largely in the form of individual homes in the suburbs. The share of privately owned housing has declined slowly since the beginning of the decade as a result of the upsurge in construction of state-owned multiple dwellings. Ownership of the land remains with the state. Privately constructed houses generally are small, averaging three or four rooms, and are poorly served, if at all, by paved streets, water and sewer lines, and electric power. The homeowner may rent or lease part of his house, but the rent is fixed by law, and the owner is responsible for maintenance.

Individual homes are also prevalent in rural areas throughout the Soviet Union, though barracks and dormitories have been constructed on the state and collective farms in newly developed regions. As a rule, rural private housing is even more poorly served by public services than its urban counterpart.

Practically all state-owned urban housing is equipped with electricity. Other utilities, such as running water, sewage systems, and gas are frequently lacking, except in large, multilevel houses in the central sections of cities. Dwellings which do not have running water are supplied with water from public taps in their courtyards or from street hydrants. Common toilet facilities with cesspools also are provided. In rural areas there is almost no plumbing. The lack of running water in towns and cities has led to the development of a system of public baths and municipal laundries, both less than adequate in numbers and service. Rural areas are dependent almost entirely upon individual or communal wells or lakes and streams. Refuse collection and disposal services are rudimentary but improving in most areas, although adequate only in the largest cities. The following tabulation shows the estimated average

worktime (minutes) required to purchase housing and utilities in New York, Paris, Munich, and Moscow in April 1969:

CONSUMER ITEM	NEW YORK	PARIS	MUNICH	MOSCOW
Monthly rent of apartment (hours of worktime)	38	135	68	11
Electricity (1 kw.-hr.)	69	375	162	354
Fuel oil (100 liters)	97	353	176	639
Monthly telephone rent	52	375	176	246

d. ATTITUDES OF THE PEOPLE—The reactions of the Soviet people to their level of living are determined by their experience. The fact that most Americans and West Europeans are better fed, clothed, and housed is largely irrelevant. To a considerable extent the average Russian accepts and even exaggerates the comparative luxury of the West, but it has little reality to him. His aspirations and bases for comparison develop within the context of his own society and from his own experience. Thus, in comparison with the postwar years of extremely high prices, shortages, and rationing, the situation today is considerably improved, and despite the still relatively difficult conditions of everyday life, the people generally seem to feel that life is becoming more comfortable and more predictable. This attitude is typical throughout the U.S.S.R., except in the Baltic republics and perhaps in Central Asia. In the Baltic areas standards of living have only recently reached levels comparable with those prevalent during the interwar period of independence, and considerably higher levels will have to be achieved before the Soviet regime is recognized as having contributed to Baltic well-being. In Central Asia conditions have improved remarkably, but the rapid expansion of population in the area has produced acute shortages of housing and other facilities and services. It has also brought in large numbers of Russians and other aliens, and native resentment at the influx and the resulting Sovietization of the area's distinctive culture probably more than counterbalances the satisfaction derived from improved living conditions.

2. Health and medical care

a. GENERAL LEVEL OF HEALTH AND SANITATION—Progress in public health in the U.S.S.R. has been impressive since 1917. A rough index of the improvement in the health of the general population is found in the declining infant mortality rates and lengthening life expectancy, as seen in the following tabulation:

	INFANT MORTALITY PER 1,000 LIVE BIRTHS	LIFE EXPECTANCY AT BIRTH
1913	273	32 (1896-97)
1926	174	44 (1926-27)
1939	167	na
1950	81	64 (1954-55)
1960	35	69 (1960-61)
1969	26.5	70 (1968-69)

The levels achieved in 1969 compare favorably with those in other developed countries.

The quality of public sanitation varies greatly in the different areas of the U.S.S.R. Although regulations require sanitary inspection of all food-handling and food-processing establishments, such regulations are not strictly enforced. Indiscriminate use of night soil as fertilizer in some areas contaminates many fruits and vegetables. Food frequently is displayed in open air markets, unprotected against flies and dust and accessible to handling and examination by customers. The degree of pasteurization of and methods of handling milk are at best questionable in many areas. The lack of adequate storage and refrigeration facilities adversely affects the regional distribution of foodstuffs, and perishable foods especially are subjected to much spoilage. The water supply and sewage disposal systems in many places are inadequate, and boiling of tapwater is frequently necessary. The high incidence of gastrointestinal infections in the U.S.S.R. is attributable in large part to the presence of pathogenic organisms in the drinking water.

b. INCIDENCE OF DISEASE—Although reporting is required for 28 infectious diseases and morbidity figures are compiled by a central statistical service, such data are not generally available. As in other developed countries, the principal cause of death in the U.S.S.R. is cardiovascular disease, which accounted for 35.3% of all male deaths and 53.6% of all female deaths in 1968. The mortality rate in that year for this disease was reported to be 291.4 per 100,000 male population, and 384.7 per 100,000 females. Of the various forms of cardiovascular disease, arteriosclerotic heart disease and hypertension are the principal causes of death among both sexes. The next major cause of death is cancer, which accounted for 16.3% of all male deaths and 16.5% of all female deaths in 1968. The mortality rate in that year for this disease was reported to be 134.6 per 100,000 male population, and 118.7 per 100,000 females. Of the various forms of the disease, cancer of the stomach is the principal cause of death among both sexes, while for males the next leading causes are cancer of the larynx, bronchial tubes, trachea, or lungs, and for females, cancer of the female reproductive organs. As in other developed countries, the death rate from cardiovascular diseases and cancer has tended to rise as life expectancy at birth increases, as may be seen from the following tabulation of deaths per 100,000 population:

CAUSE OF DEATH	1960	1965	1968
Cardiovascular diseases	247.3	313.2	345.9
Cancer	115.5	123.6	126.5

Other important causes of illness and mortality are respiratory infections, especially tuberculosis, influenza, and pneumonia; enteric infections, particularly salmonellosis, gastroenteritis, and dysentery; parasitic infections, especially various tapeworms; and viral infections, especially hemorrhagic fevers and tickborne encephalitis. Among animal diseases transmissible to man which constitute significant problems in the U.S.S.R. are brucellosis, rickettsial infections, and tularemia. Mental and nervous disorders are common,

and alcoholism has always been widespread. The most common childhood diseases are respiratory ailments, measles, hepatitis, scarlet fever, chickenpox, and mumps. Diphtheria has been virtually eliminated, and whooping cough and tetanus have also declined sharply among children. Other diseases brought under control or virtually eradicated are typhoid fever, malaria, smallpox, typhus, poliomyelitis, and trachoma. However, the Soviet Union has experienced occasional local outbreaks of diseases thought to be under control. Thus, in 1970, the regions bordering the Black and Caspian Seas were subject to an outbreak of cholera, 750 cases being reported to the World Health Organization by October 1970. Figure 72 illustrates the incidence of certain diseases per 100,000 persons in selected years since 1940.

Although the incidence of animal diseases has been significantly reduced by Soviet veterinary authorities, many continue to be prevalent. Foot-and-mouth disease is probably the most economically significant animal disease in the U.S.S.R. Brucellosis is a close second as a livestock economic problem, especially as it is easily passed to personnel associated with livestock. Other prevalent diseases among animals are hog cholera, equine encephalomyelitis, and various hemoprotezoal diseases.

Tourists and other nonindigenous persons who have received standard international immunizations before entering the U.S.S.R. and who are disciplined in the accepted practices of health and sanitation should encounter no unusual problems. However, persons may be exposed to several indigenous diseases for which vaccines are not yet available. Diseases which can incapacitate large numbers of persons in a short period of time include acute respiratory infections, hepatitis, enteric infections, and tickborne encephalitis. Acclimatization may be difficult, and frostbite may be a major hazard in some areas.

c. MEDICAL ORGANIZATION AND ADMINISTRATION—Health services in the U.S.S.R. are adapted to the requirements of the national economic plan. They are designed to provide comprehensive medical care to the

FIGURE 72. INCIDENCE OF SELECTED DISEASES
PER 100,000 PERSONS, 1940-69

DISEASE	1940	1960	1965	1969
Measles	605	972	923	212
Scarlet fever	129	313	230	181
Infectious hepatitis	na	239	204	141
Whooping cough	232	259	82	22
Typhoid and paratyphoid fevers	62	22	11	9
Louse-borne typhus	25	2.9	1.6	1.2
Diphtheria	91	25	2	0.7
Tetanus	na	1.1	0.6	0.3
Malaria	1,637	0.17	0.14	0.14
Acute poliomyelitis	*0.7	3.3	0.13	0.08

na Data not available.

*Low incidence report probably the result of inadequate diagnosis and recording.

25X1

entire population through the integration of curative and preventive services. As the responsibility for the health of the people is placed on the government, all health establishments are government owned and maintained, as are all scientific and research institutions. Medical health services are usually free to Soviet citizens, but fees are assessed for care in some sanatoriums and clinics and for pharmaceuticals prescribed for nonhospitalized patients.

Virtually all health and medical services are the responsibility of the national Ministry of Health, which also formulates national policy in health matters. Subordinate to the national Ministry of Health are the ministries of health of the republics, to which are subordinate the health authorities of the autonomous republics, and so on down to the local level. Exceptionally, the Ministries of Defense and Internal Affairs may administer some health services, but even here the main policy lines are in accord with the policy set by the Ministry of Health for the Soviet Union as a whole.

The organization of the Ministry of Health of the U.S.S.R. is a complicated, highly ramified structure consisting of a number of institutions and functional units so interlocked that the result is a unified system embracing all disciplines and reaching into every locality in the 15 constituent republics. The ministry controls and directs medical practice and facilities, the education of medical personnel, and the production and distribution of medical materiel. It also controls the health budgets of the republics and the establishment, supervision, and enforcement of medical standards. Furthermore, it establishes priorities pertaining to medical research.

Because the Soviet citizen does not pay for medical care directly, and because there is no specific medical care deduction from his wages, costs must be financed largely through the government budget. Soviet sources estimate that free medical care has the effect of adding about 7% to real wages. The following tabulation outlines the rise in funds spent on public health in the U.S.S.R. since 1940:

SOURCE OF FUNDS	YEARLY AMOUNT			
	1940	1960	1965	1969 (preliminary)
	- - - Billions of rubles - - -			
State budget	0.9	4.8	6.7	8.6
Percent of total budget ..	5.2	6.6	6.6	6.2
Other funds	0.2	0.9	1.2	2.4
Total expenditure	1.1	5.7	7.9	11.0

The contributors of the other funds for public health services are state, cooperative, trade union, and other public enterprises and organizations, as well as collective farms. In 1969 expenditures on public health equaled approximately 4.1% of the national income.

While the health services emphasize prophylaxis, adequate therapeutic care is becoming increasingly accessible to those living in isolated rural areas. Followup and dispensary methods are characteristic of

the integration of preventive and curative medicine in the U.S.S.R. The procedure includes the screening of millions of the population yearly, using all the necessary laboratory techniques. Among those covered in this way are all children, adolescents, students, expectant mothers, women over 35 years of age (for early diagnosis of cancer), and workers in the main branches of industry, especially those in dangerous occupations. Outpatient departments attached to hospitals, polyclinic dispensaries, and outpatient clinics in cities, industrial estates, and rural areas are constantly engaged in this work. The aim of the overall health service program is to detect the earliest stage of disease—at the moment of functional disturbance, if possible—and to take care of the patients throughout their illness, adapting their work to their state of health, and, as far as possible, to improve their living conditions.

d. MEDICAL PERSONNEL AND HOSPITAL FACILITIES—

In terms of availability of medical personnel and hospital facilities to the general population, the Soviet Union ranks high among the developed countries of the world. In 1969 there were 555,400 physicians and 87,100 dentists, stomatologists, and dental practitioners in the U.S.S.R., the ratios being 23 physicians and 3.6 dentists per 10,000 population. Only Israel outranks the Soviet Union in terms of physician-population ratio, while the United States and most West European nations have attained only 50% to 75% of the Soviet level. There is a comparatively ample number of veterinarians and pharmacists in the U.S.S.R.—174,000 veterinarians and veterinary auxiliaries in 1966 and 161,300 pharmacists and pharmacists' auxiliaries in 1969. Professional, university-trained medical personnel are assisted by auxiliary medical personnel who have completed secondary-level medical training. Included among the 2,029,700 such personnel in 1969 were nurses (986,800); *feldshers*, or medical aides (452,000); midwives and obstetric *feldshers* (285,000); and laboratory, X-ray, and dental technicians (127,200). There were 2,567,300 hospital beds in 26,384 hospitals of various types in 1969, or 106.2 beds per 10,000 population, a ratio which compares favorably with those of most advanced industrial nations. In 1968 the ratio in the United States was 83:10,000.

In contrast to the rest of the world, medicine in the Soviet Union is a woman's profession. Approximately 72% of all physicians and dentists, 93% of all auxiliary medical personnel, and 85% of all persons employed in medicine in 1969 were women. Most top positions in medicine, however, whether in administration, research, or clinical medicine, are held by men. Figure 73 outlines the development of public health services in the Soviet Union from 1913 to 1969. There are substantial variations in the supply of medical personnel and hospital facilities among the various republics, with the European part of the R.S.F.S.R., the Ukraine, Latvia, and Estonia significantly better served.

FIGURE 73. DEVELOPMENT OF PUBLIC HEALTH SERVICES, 1913-69

	1913	1940	1960	1969
Number of physicians and dentists (thousands).....	28.1	155.3	431.7	642.5
Number per 10,000 population.....	1.8	7.9	20.0	26.6
Number of auxiliary medical personnel (thousands).....	46.0	472.0	1,388.3	2,029.7
Number per 10,000 population.....	2.9	24.0	64.2	84.0
Number of hospitals (thousands).....	5.3	13.8	26.7	26.4
Number of hospital beds (thousands).....	207.6	790.9	1,739.2	2,567.3
Number per 10,000 population.....	13.0	40.2	80.4	106.2

The average quality of Soviet physicians is good, but their general level of competence does not equal that of the ordinary practicing physician in the United States. Much of the Soviet physicians' 6½-hour day is spent in routine examinations, home calls, and heavy administrative duties. In addition, they perform many tasks which in the West are delegated to technicians and specialized nurses. Doctors are under constant pressure from the government to keep industrial absenteeism to a minimum, fulfill quantitative performance norms as to time spent per patient and patients seen per day, and make available on request the detailed records they are obliged to keep on their patients. None of these conditions is conducive to building up a close and trusting doctor-patient relationship. Most doctors, as employees of the state, are not accorded social status and income levels comparable to those in the West, but instead they are placed on the same level as highly skilled industrial workers.

Regionalization of hospitals and polyclinics is the ultimate basis for providing a reasonable level of services throughout the Soviet Union. Thus, the hospital network is based on numerous urban and rural units of 10 to 51 beds, which refer patients as necessary to district hospitals of about 100 to 200 beds. These in turn orient toward the large regional or municipal hospitals in the main cities. There is no hesitation to refer a patient from a peripheral to a central unit. A specialist from a central hospital does occasionally go out to smaller hospitals, but usually it is the patient who is moved. Once hospitalized, the patient receives a range of treatments similar to that in other European countries. There is more physical therapy, exercise, and diet and somewhat less emphasis on diagnostic laboratory and X-ray examinations than in the United States.

The quality of medical treatment varies widely. Medical care available in urban areas is markedly better than in the countryside, where much of the outpatient work is performed by auxiliary medical personnel such as nurses, midwives, and *feldshers*. Remote areas are served by "sanitation squads," who

travel a circuit of localities providing on-the-spot care. Imbalance in the availability of medical care is also evident in a class as well as a geographical sense. Besides the general network of medical facilities run by the Ministry of Health, there is a closed network whose facilities usually are reserved for the high-ranking members of Soviet society—party officials, the technical elite, and successful artists and athletes. The closed facilities are comparatively luxurious, and the ratio of physicians to patients is much lower. In addition, some wealthier citizens prefer to pay for private medical services in the physicians' off-hours. For all the improvement in medical and hospital care in the Soviet Union since 1917, the general level of such care remains below that in the West.

e. VOLUNTARY ORGANIZATIONS—Nationwide health campaigns—including mass inoculations, which have contributed heavily to the reduction of infectious diseases—are conducted by the central government with the help of volunteer organizations. Included among these are the Red Cross and Red Crescent Alliance, the trade unions, the Committee of Soviet Women, the Pioneer organization, and the Komsomol. The Red Cross and Red Crescent Alliance, with over 69 million members and 400,000 local organizations, is the most active of these groups in the area of auxiliary medical assistance. The general activities of the members of this organization, which is largely financed by the government, include assisting the health authorities in such ways as educating the public in hygiene and accident prevention, distributing pamphlets and health literature, teaching first aid, inspecting living quarters and workshops in order to detect conditions injurious to health, helping patients who have been discharged from the hospital, collecting blood for transfusions, and even providing relief funds and equipment to the victims of natural catastrophes. Finally, the Red Cross and Red Crescent Alliance is charged with the paramilitary function of cooperating with the medical services of the armed forces, particularly in time of war.

f. EMERGENCY MEDICAL SERVICES—The Soviet Government has worked out an elaborate plan of emergency services for disaster relief, including the medical aspects of civil defense. This plan includes preparedness of public health institutions, including close cooperation with the volunteer organizations; training of the populace, starting with the adolescent age groups; and organization of graduates of training courses into active competitive groups. Sanitary-epidemiological stations, factory health rooms, first aid stations, outpatient clinics, and hospitals are prepared to step in immediately in the event of a disaster. The militia is charged with warning the populace of emergencies and with rendering first aid and assistance in case of accident, assault, or natural catastrophe. Cadre teams, made up of Red Cross and Red Crescent members subject to immediate draft in emergencies, are called in to assist public health agencies in rendering

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first aid and transporting victims of disasters, and they also aid public health personnel in sanitary and epidemic control.

3. Social welfare

The Soviet Union has an extensive program of social services covering a wide range of contingencies and a large segment of the population. Under the Soviet constitution, "citizens of the U.S.S.R. are entitled to material security in old age and in case of sickness and disability." However, except for medical services, which are free to all, the program is not available in equal measure to all members of the population.

a. ORGANIZATION AND ADMINISTRATION—The basic administrative pattern for social services has remained virtually unchanged since the 1930's. The four bodies directly involved are the Ministry of Welfare (which exists at republic level only), the Ministry of Education, the Ministry of Health, and the All-Union Central Committee of Trade Unions (AUCCTU). If the primary need of a person seeking help is health care, he is referred to an agency of the Ministry of Health; if the best way to solve his difficulties is through training, he is sent to an agency of the Ministry of Education; if he requires custodial care or long-term economic assistance, he turns to an agency of the Ministry of Welfare; if he is a member of the labor force and needs assistance, economic or social, arising out of temporary illness, or for rest and recreation, he applies to the trade union at his employing establishment. Of these four bodies, however, only the 15 republic-level ministries of welfare devote their entire activity to social services; welfare is only an auxiliary function for the other three.

The 15 welfare ministries are tied to the national administration through the State Committee for Labor and Wages—specifically, the bureau of state pensions within this committee. In contrast, the Health and Education Ministries operate at both the national and republic levels for all their functions. The conclusion

thus is inescapable that there is no national ministry of welfare because welfare is not yet considered as important as health or education. This puts welfare ministries at a disadvantage. Compared with the health and education ministries, in particular, they have less prestige and fewer resources, and their personnel are less skilled. Because they stand lower in the bureaucratic hierarchy, furthermore, the 15 republic-level welfare ministries do not find it easy to obtain cooperation for interdisciplinary endeavors.

The AUCCTU has the major role in the social welfare program. Since 1933 this body has been responsible for the planning and administrative aspects of all worker-connected benefits. Trade union social insurance commissions are established in every state enterprise employing 100 or more workers. They examine claims, settle disputes over employer-employee responsibility, issue passes to rest homes and sanatoriums, prepare social insurance budgets for the enterprise, and supervise programs designed to reduce the incidence of sickness and injury. Regional trade union councils supervise the local commissions, and the AUCCTU is responsible for the entire program. As such it disburses nearly three-fourths (74.1% in 1969) of the funds assigned for social welfare and social insurance purposes in the U.S.S.R. The remaining one-fourth is distributed by the republic ministries of health and of education, the national Ministries of Defense and of Internal Affairs, and other organizations for social welfare benefits covering certain groups within their purview. Figure 74 outlines the rise in funds spent on all aspects of social welfare in the U.S.S.R. since 1940, and Figure 75 details the expenditure of funds for social insurance purposes in 1969. The contributors of the other funds for social welfare programs are state, cooperative, trade union, and other public enterprises and organizations, as well as collective farms. In 1969, expenditures on social welfare equaled approximately 7.7% of the national income.

FIGURE 74. SOCIAL WELFARE EXPENDITURES, 1940-69

SOURCE OF FUNDS	ALLOCATION	1940	1960	1965	1969
					(PRELIMINARY)
		— — — —	<i>Billions of rubles</i>		— — —
State budget.....		0.9	9.8	14.0	20.0
Percent of total budget.....		5.4	13.4	13.8	14.4
	Social welfare.....	0.3	6.5	9.1	12.0
	Of which funded by social insurance.*	0.2	4.2	6.5	9.0
	Social insurance*.....	0.5	2.8	4.0	6.3
	Grants to mothers with many children or no husband.	0.1	0.5	0.5	0.4
	Funds transferred to Collective Farm Social Welfare Fund.	...	...	0.4	1.3
Other funds.....		...	0.2	0.4	0.7
Total expenditure.....		0.9	10.0	14.4	20.7
	Of which, pensions.....	0.3	7.2	10.6	15.0

... Not pertinent.

*Disbursed by trade unions.

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**TOTAL EXPENDITURES
19 BILLION RUBLES**

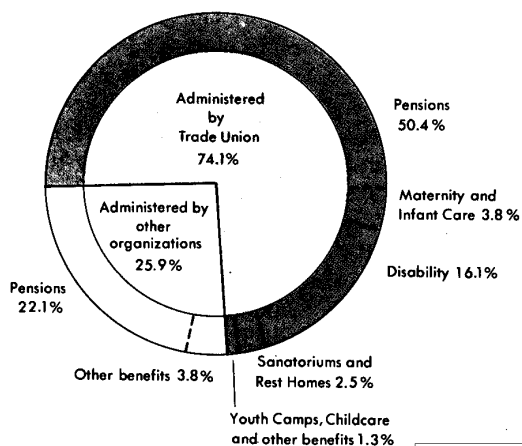


FIGURE 75. Social welfare budget, 1968

b. **INSURANCE PROGRAMS**—The largest proportion of the social welfare budget is devoted to pensions; in 1969 the figure was 72.5% of the total. Of the 15 billion rubles allotted for pensions, 10.4 billion were disbursed by the trade unions, largely for workers and employees, and 4.6 billion were distributed by government bodies largely for collective farmers and war veterans. The following tabulation shows how the number of persons on the pension rolls has increased since 1940 (in millions of persons):

YEAR	OLD AGE, INVALIDISM, SURVIVORS*	VETERANS AND SURVIVORS*	TOTAL
1941	3.6	0.4	4.0
1960	15.0	6.0	21.0
1965	21.0	5.0	26.0
1970	35.7	4.4	40.1

*Widows, orphans, and dependent children.

The pension law of 1956, a milestone in Soviet social security legislation, increased the number of persons eligible for benefits and also substantially raised these benefits. It provided coverage to nearly all categories of workers except the collective farm group, who were not brought into the system until 1965, and then only with reduced benefits. In 1967 additional legislation was adopted to accord the collective farm workers better treatment, but the wage and salary workers still retain an advantage. In 1970, 12.1 million of the 40.1 million persons on pension were collective farmers. The average old-age pension for wage and salary workers is about 60 rubles a month, and for collective farmers about 17 rubles a month. Of the 40.1 million persons receiving pensions in 1970, 8 million continued working to supplement their inadequate income.

Men generally become eligible for old-age pensions at 60 and after 25 years of service, and women at 55 and after 20 years of service. Age and work requirements are lowered 5 to 10 years for difficult or dangerous work, for mothers of five or more children, for the blind, and for dwarfs. The pension is suspended if concurrent earnings

exceed 100 rubles a month. Eligibility for invalidity and survivors pensions is established at 2 to 20 years of work for men and 1 to 15 years of work for women and for dangerous work, depending on the age of the worker at his invalidity or death. Old-age pensions are limited to a range of from 30 to 120 rubles a month, based on a scale sliding from 100% of average earnings in the last year of work, if they are below 35 rubles a month, to 50% of average earnings if they are above 100 rubles a month. Supplements are awarded for length of employment and number of dependents. Invalids' pensions range from 16 to 90 rubles a month, depending on the degree of invalidism as well as the size of earnings, while survivor pensions can range from 21 to 120 rubles, depending on the number and type of survivors in addition to the size of earnings. All three types of pensions are 15% less in rural areas.

The second largest social welfare expenditure is on disability benefits. Those temporarily disabled receive 100% of their earnings, with a minimum of 30 rubles a month, from the time of their disablement until well or placed on a permanent disability pension. Those with permanent disability receive a pension of from 21 to 120 rubles, depending on the degree of disability and the size of earnings. Supplements are awarded for employment in difficult or dangerous work and for dependents. Medical benefits are provided by the governmental health agencies furnishing care to the population generally. The families of those who die of work injuries receive survivor benefits in a range of 21 to 120 rubles a month, depending on the size of the earnings and the number of dependents. All three types of benefits are 10% to 15% lower in rural areas.

Sickness and maternity programs are based on a combination of social insurance (cash benefits) and public service (medical care) approaches. Sick pay equivalent to from 50% to 90% of earnings, depending on length of employment, is paid from the day of incapacity until recovery. These benefits are 10% lower in rural areas and 50% lower for nonmembers of unions. Maternity benefits equivalent to from 66% to 100% of earnings, depending on length of employment, are payable 8 weeks before and 8 weeks after confinement (10 weeks after in cases of abnormal confinement). Nonmembers of unions receive only 66% of earnings as maternity benefits. Medical services are provided directly to patients by governmental health agencies. Pregnant women and nursing mothers are permitted to transfer to lighter work while retaining their previous level of earnings. A grant of 12 rubles for a layette and 18 rubles for an infant's food is provided if total family earnings are less than 50 rubles a month.

c. **ASSISTANCE PROGRAMS**—Outside the social insurance system but related to it is the family allowance program. Under this program a flat grant of 20 rubles is paid on the birth of the third child, with subsequent grants rising to 250 rubles for the 11th and each additional child. In addition, a monthly allowance of 4 rubles is paid for the fourth child until age 5, rising

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progressively to 15 rubles for the 11th and each additional child. Unwed mothers receive monthly payments for the support of their children, beginning with the birth of the child and continuing until the 12th year, rising progressively from 5 rubles a month for the first child to 10 rubles for the third and each succeeding child. There is in addition a network of nurseries, kindergartens, extended-day schools, and boarding schools available to working mothers, most of which are free or charge only a nominal fee.

Services for the aged, disabled, and handicapped include, besides economic support in the form of pensions and benefits, institutional placement and medical care, and training, retraining, and job placement for those able to work. The programs designed for the aged as well as for those disabled or handicapped but able to work are handled by the republic ministries of welfare. For those disabled or handicapped who are of school age and educable, the Ministry of Education provides a network of schools, including special schools for the deaf, blind, visually handicapped, mentally retarded, and children with speech defects and orthopedic conditions. Children who are not educable are placed in homes for the physically handicapped or mentally deficient managed by the republic ministries of welfare. Societies for the deaf and the blind assist the government's social welfare program by helping supervise the training and working conditions at the special enterprises employing these groups.

d. STRENGTHS AND WEAKNESSES OF SOCIAL WELFARE SYSTEM—Starting well behind the other developed and developing countries of the world, the Soviet Union has reached a very advanced level in terms of the quality and extent of its social welfare program. Indisputably one major advance has been the steady broadening of the category of those with a legal right to comprehensive income assistance, and thus freedom from degrading means tests and humiliating charity. The movement toward the guarantee of a decent minimum income has been furthered by the all-inclusive nature of the coverage offered by social insurance, the rising level of insurance benefits, and the reduction in the number of people in the rural population with inadequate protection. Furthermore, in all welfare arrangements assistance is given in the form of money, so that beneficiaries retain the power to regulate their own affairs and are not set apart from the rest of the population by being deprived of the ability to make monetary transactions.

Yet there are weak points in the Soviet welfare program. Welfare services are not uniformly available throughout the country. The rural population does not receive anywhere near the benefits and services that the urban population has. Income maintenance programs do not cover all losses of income, and the benefits they provide are often inadequate. For example, there is no unemployment compensation, because Soviet authorities insist that there is no unemployment as long as job openings in the economy as a whole exceed the number

of workers available to fill them. The authorities refuse to recognize that people who are having a hard time finding employment are not helped by the availability of work in some distant place to which they are unable or unwilling to go.

In addition, social insurance benefits, while improving, are frequently inadequate. Current pensions are only a fraction of the minimum wage and an even smaller fraction of the average wage. It is clear that pensioners, on the average, are living below the level they had prior to the loss of income against which they were insured. This is especially true of survivors. The meagerness of their benefits belies the regime's alleged concern for large families and underscores its use of the social insurance system to motivate people to work. It is remarkable that the Soviet public assistance program offers only the feeblest aid to needy persons excluded from social insurance and to those whose insurance benefits are too low for them to maintain a decent standard of living. Soviet silence with respect to this aspect of welfare administration—in contrast to the abundance of material available on social insurance—is evidence of the regime's embarrassment over the fact that it has neither eliminated want nor devised a system for coping with it when it appears.

4. Social problems

According to Communist doctrine, social problems are a product of a "class society." In a socialist society, where in principle there are no competitive classes and no conflict of interests between the rulers and the ruled, there is said to be no "objective cause" for social problems. The continued evidence of social problems in the Soviet Union, proclaimed a socialist state in 1936, is attributed officially to "survivals of capitalist mentality" and the "infiltration of socialist countries by agents and spies of the capitalist world." In addition parents, teachers, party members, the Komsomol, and other organizations and institutions charged with the upbringing of youth, are criticized for failing to cope with the various crimes, delinquencies, and grievances still associated with modern Soviet life and more or less typical of all rapidly changing and industrialized societies. Yet the government is moving away from its earlier ostrich-like position of banning or heavily censoring statistics on or studies of social problems in the Soviet Union. Though still operating under considerable politically inspired restraints, the new Soviet academic field of sociology has shed some light on such areas as life in the countryside and use of leisure time, and as the field's usefulness has been demonstrated, there has been some discussion pointing to the eventual broadening of the permitted areas of investigation.

It is rarely possible to establish a direct causal relationship between illegal or antisocial behavior and a given social situation, for there are generally a number of contributing causes; but the crowded housing conditions still prevalent would seem to be the primary cause of a considerable amount of litigation and crime.

Reported legal actions range from complaints over nonconformance with house rules to accusations of assault with intent to kill. It seems inevitable that overcrowding and space allocation procedures forcing people of different interests and backgrounds to share common facilities should result in social strains.

a. **CRIME**—In Communist doctrine a crime committed in a socialist state is not simply a breach of the law but an offense against the whole political and social order. It is the task of all other members of the offender's living and working units to assist the agencies of the state in subjecting him to such measures of coercion or persuasion as may be necessary to give him a due sense of his responsibilities to the community. This view often leads to a blurring of the distinction between crime and any other form of deviant, nonconformist behavior.

Ordinary crimes, such as murder, rape, and burglary, appear to constitute the bulk of criminal cases prosecuted in Soviet courts. In addition the Soviet Union recognizes two other types of crimes, crimes against the state and economic crimes. Some of the former, such as treason, are specifically defined by the criminal code, and most are punishable by death. Other types of state crimes, however, are so vaguely defined that almost any act disapproved by the regime can be designated as especially dangerous simply on the word of the enforcement authorities. Economic crimes are considered threats to the very foundation of socialist society and are dealt with harshly, in some instances with the death penalty. Not only are instances of theft, destruction, and misuse of state property severely penalized, but numerous economic activities considered legitimate in non-Communist states are under ban. The latter are classed as "speculation," defined as the "buying and reselling of goods by private persons for the purpose of obtaining a profit."

Juvenile delinquency receives continuous attention from Soviet authorities. It appears to stem from the same basic causes as in most countries undergoing rapid urbanization and industrialization. Family solidarity and control over the children have been lessened through crowded living conditions, lack of family privacy, the high proportion of working mothers, and the vast difference between the official ideal as trumpeted by party propaganda and the everyday reality of life. The sense of boredom and frustration afflicting so many youth is aggravated by the lack of recreational facilities and by the tradition of drunkenness and the availability of vodka. Delinquency is particularly painful to the U. S. S. R. because according to Communist theory a new kind of socially conscious individual, the Soviet man, is supposed to be a product of society.

b. **VAGRANCY**—Though there is very little information on begging in the U. S. S. R., Soviet press reports state that there are instances of young people supplementing their earnings this way. The youths apparently are not disabled or destitute, but merely find it easier and more profitable to beg than to hold a

steady job. They take advantage of the fact that they cannot be arrested so long as their papers are in order and they avoid behavior classifiable as "hooliganism."

According to Communist doctrine prostitution derives from the inequality of women in capitalist countries and cannot exist in a socialist society. Yet it is very much in evidence in urban areas, where women can easily resort to this profession to supplement their incomes. Casual prostitution is also carried on by peasant women visiting town on brief shopping excursions. Punishment for offenders includes exile to remote areas of Siberia, but enforcement of antiprostitution laws does not appear to be vigorous. No information is available on the extent of venereal disease or on the regime's policy toward it.

c. **ALCOHOLISM AND DRUG ABUSE**—In the official ideology alcoholism is specifically the product of a diseased and disorganized economy and society and will be eliminated completely by communism. Despite determined efforts by the regime to control chronic drunkenness, both as a major factor in many crimes and as a social evil in itself, heavy drinking persists in the Soviet Union, per capita consumption amounting to nearly three times that in the United States. Hard work for long hours under strict discipline, the lack of comfort in living arrangements, and the general drabness of life for the average worker are probably the major causes. Even among members of the elite there are repeated instances of drunkenness, often leading to public scandal.

Paradoxically, the recent changeover to a 5-day workweek and consequent doubling of available leisure time has aggravated the problem of alcoholism. Most cultural and recreational facilities as well as many essential services either closed or sharply curtailed their activity for the weekend, and the regime has not moved to stagger workweeks or increase its investment in areas where these services were inadequate to begin with. As a result workers are inclined to turn to alcohol for diversion, despite the sharply increased price of vodka and the inadequate number of sales outlets in relation to the demand. To supply this unslaked demand a flourishing illegal distilling and bootlegging business has grown up throughout the country.

As little precise information as there is about alcoholism in the U. S. S. R., even less is known about drug abuse. Smuggling of narcotics such as opium and heroin, as well as other drugs such as hashish and cocaine, has long been a common practice along the frontier dividing the Caucasian and Central Asian Soviet republics from Turkey, Iran, and Afghanistan. Manmade drugs, such as the various amphetamines, tranquilizers, and hallucinogens, have been brought in by Western tourists as well as by Soviet citizens returning from abroad; such drugs have also been stolen from or manufactured illicitly in Soviet laboratories. While the drug problem in the U. S. S. R. is nowhere near the serious stage it has reached in the West, it is growing, and judging from comments here and there in the press it has already become a matter of concern for the authorities.

F. Religion

1. Government and religion

Marx wrote that "religion is the opiate of the people," and Lenin subsequently made this idea a cornerstone of Communist dogma on religion. The Soviet regime has made it clear that it is implacably opposed to all religions, and that its ultimate aim is their total destruction. In 1961 the 22d Party Congress set 1980 as the date when "religious prejudices" would be overcome, simultaneous with the expected achievement of communism in the U.S.S.R.

In the interim the regime has addressed itself not only to the combating of religious belief but also to the neutralization and control of existing church organizations. To these ends, the execution of its policy has vacillated between repression and toleration, the regime bearing down during periods of confidence, such as in the immediate postrevolutionary period, the 1930's, and the early 1960's, and easing up when trying to win the support of the people, as during the New Economic Plan (NEP) period (1921-28), the war and immediate postwar periods under Stalin, and again in the mid-1950's, during the jockeying for power following the death of Stalin. Since the fall of Khrushchev, pressure on religious belief has slackened somewhat, but none of the ground lost by the various churches in the 1959-64 period has been regained.

a. THE LEGAL POSITION OF RELIGION—The Declaration of the Rights of the Peoples of Russia, published by the Soviet regime within a week of its seizure of power in 1917, abolished all national and religious privileges and restrictions. The ordinance thereby did away with the traditional classification of the different religions in the country as "dominant" (Russian Orthodoxy), "tolerable" (Roman Catholicism, Lutheranism, Islam, the Armenian church, and other religions professed by non-Russians), and "intolerable" (sects and schisms within Orthodoxy, missionary religions among the Orthodox, and Judaism). This declaration was followed in early 1918 by a Decree on the Separation of Church from State and School from Church, which disestablished Russian Orthodoxy as the state church; stripped all churches of civil functions, such as registration of births, marriages, and deaths; banned religious oaths and public rites; nationalized all property of religious organizations without compensation (churches had been deprived of the right to own land in the 1917 Decree on Land); ended all state expenditures for religion and state support for priests, as well as the right of the church to tax believers; removed religion from the school curriculum and closed down parochial schools; and abolished religious tests, bans on interfaith marriages, and barriers to conversion or withdrawal. Other measures affecting the church immediately after the 1917 revolution allowed freedom of antireligious propaganda, reduced priests and clerics to a socially inferior position, banned all religious instruction to persons under age 18, withdrew legal recognition of church marriages and divorces, dissolved monasteries

and convents, tried and then executed or exiled churchmen, and promoted schismatic and sectarian activity. 125X1

In 1929 a Decree Concerning Religious Associations was enacted to establish rigid rules for church activity, deal with the legal position of religious organizations, and codify earlier regulations. According to this decree the state gave its recognition to those religious denominations whose adherents registered as religious societies (more than 20 believers) or groups of believers (less than 20 believers). Following registration with the local civil authorities, the religious society or group of believers was eligible to negotiate with these authorities for the use of buildings and objects of worship. The collecting of money by national or regional church organizations was banned, such activity to be done only by the registered local religious societies or groups of believers and only among their membership. Out of these donations the church buildings and clergy were to be maintained. Charitable activity was forbidden, as was the establishment of mutual aid funds, cooperatives, literary, handicraft, or study groups, children's playgrounds, medical aid groups, or sports organizations. Registered societies and groups of believers were allowed to organize regional and national congresses, which could elect administrative bodies.

The 1929 decree still largely determines church organization and activity in the Soviet Union, although a few modifications have been introduced. Thus, according to a 1945 decree, churches were given the right to build, rent, or acquire property and articles of worship. There also exists a "secret" decree barring children from 3 to 18 years from attending church services. All religious groups are under the supervision of the Council for Religious Affairs, a body attached to the U.S.S.R. Council of Ministers which exercises control over local church activities through officials at the local and republic levels. Government authorities approve the appointments of the hierarchies of all denominations. Religious works, like all other publications in the U.S.S.R., must be cleared by the state censor. Other practical problems, such as obtaining building materials for the construction and repair of churches and church-connected buildings, arranging for the manufacture of candles and other articles of worship, and obtaining foreign currency for churchmen traveling or studying abroad, are handled by the appropriate state agencies once the Council for Religious Affairs has granted its approval.

In exchange for the official toleration of religion the regime has extracted support for its foreign and "peace" policies from prominent religious leaders. Soviet church organizations have been the principal backers of the World Christian Peace Conference based in Prague and also have taken part in the Communist-front World Peace Council. From time to time, church organizations have also denounced American and Israeli "aggression," concomitantly backing the "just" struggle of the Vietnamese, Arab, and other peoples. The government has on occasion given support and material aid to

various denominations when such efforts have aided Soviet foreign policy, and it has sanctioned and even prompted efforts by Soviet religious denominations to exert influence or control over fellow communicants abroad. In 1970 there were 14 officially recognized denominations: Russian Orthodox, Georgian Orthodox, Old Believer, Evangelical Christian Baptist (including Pentecostals and Mennonites), Seventh-day Adventist, Molokan (Spiritual Christian), Lutheran, Calvinist (Reformed), Methodist, Roman Catholic, Armenian Apostolic, Jewish, Muslim, and Buddhist.

b. ATHEISM—Although the regime has tolerated and made use of organized religion, it continues to sponsor atheistic propaganda to destroy religious belief. The basic outlines of the campaign against religion were set down in 1923, and included the following measures to be taken: 1) publication of "popular scientific" literature, particularly literature which would "seriously elucidate the history and origin of religion," and of pamphlets and leaflets which could "unmask the counterrevolutionary role of religion and the church, as well as the physiognomy and real class nature of the various sects having influence over the popular masses"; 2) organization of "mass antireligious propaganda in the form of lively and comprehensible lectures"; 3) special training of party agitators and propagandists for the "struggle against religion," and organization under party supervision of "special antireligious study circles and seminars"; and 4) "instruction in school of the toiling masses of town and country in the spirit of materialist natural science."

The first atheist newspaper, founded in late 1922, was *Bezbozhnik* (The Godless), and a League of the Godless was organized in 1925 as a mass organization to spread the word. In addition to issuing a spate of atheist publications and conducting courses in numerous languages, the league opened and maintained antireligious museums, usually in confiscated church buildings, organized antireligious festivals coinciding with church holidays, conducted ceremonial burnings of icons and seizures of church bells, and carried out a campaign of church closures in response to "popular demand." After 1930 the intensity of the atheist campaign slackened—*Bezbozhnik* shut down temporarily from 1934 to 1938 and for good in 1941, the number of antireligious museums fell by one-fourth, antireligious festivals were discontinued, and the league itself was disbanded immediately after the German invasion in 1941.

The powerful revival of religion during the war persuaded the regime that the earlier blatant antireligious campaigns would have to be replaced by subtler methods. Beginning in 1944 the Central Committee of the Communist Party stressed the need for "scientific educational" propaganda in order to "overcome the revivals of ignorance, superstition, and prejudice." The All-Union Society for the Dissemination of Political and Scientific Knowledge, one of whose tasks was to conduct antireligious propaganda, was organized in 1947. Maintaining its campaign against

religion, it was renamed the *Znaniye* (Knowledge) society in 1963. A new periodical devoted solely to atheism and religion, *Nauka i religiya* (Science and Religion), began to appear in 1959 under the society's auspices, and by December 1970 it had a circulation of 290,000. At the same time a network of Atheist Houses, Atheist Clubs, and Universities of Atheism was established at the local level to act as focal points for antireligious work. In 1964 an Institute of Scientific Atheism was set up in the Academy of Social Sciences attached to the Communist Party Central Committee to improve the theoretical level of atheistic propaganda and the training of propagandists, and to direct and coordinate antireligious work at all levels.

From 1954 to 1959 there was a lull in the antireligious campaign as a result of limitations set by the party on the ridicule of religious people and the use of "administrative action"—i.e., coercion. From 1959 to 1964, however, the antireligious campaign once again intensified by degrees, reaching a peak just before Khrushchev's fall. Since that time, in step with regime efforts to assure support for the new leadership, antireligious propaganda has become somewhat less strident, although it is still much in evidence. Besides the usual methods of printed and visual propaganda, lectures, and courses, other devices have been resorted to with varying success, such as the introduction of secular ceremonies to replace baptism, confirmation, and religious marriages and funerals, or to obscure religious festivals; the forcible closure of churches (as many as 14,000 out of 22,000, according to some estimates), monasteries and convents (60 out of 70), theological seminaries (five out of eight), and pilgrimage points; and virulent attacks on ministers of religion.

Although the effect of more than a half century of antireligious propaganda has undoubtedly contributed, it would seem that the gradually declining importance of religion in the Soviet Union is largely a consequence of the changes introduced by the increasing urbanization of the country. It has been estimated that the total number of professing believers in all denominations has dropped from approximately four-fifths of the population in 1914 to approximately one-fourth to one-fifth of the present population. Alongside this group should be cited the large number of nominal believers and even nonbelievers who persist in the practices of baptism, marriage, and burial according to the rites of the church. Statistics on the extent of this practice are not known, but, on the basis of a poll taken in the city of Gor'kiy in the late 1960's by the Komsomol, well over 60% of the young couples interviewed had had their children baptized.

Most of the believers belong to one of the 14 recognized denominations. There also exist a large number of religious bodies—perhaps 30 to 40—which are either ignored by the authorities or harassed as illegal organizations. This "religion of the catacombs" in the Soviet Union has many shapes and forms ranging

from the Greek Catholic (Uniate) Church to small circles of Jehovah's Witnesses, and new groups are constantly forming.

In addition to those members of the population at large who have either remained loyal or returned to organized religion with its embracing network of customs and rituals, there are notable individual examples within the creative intelligentsia, such as Pasternak, Sinyavskiy, and Solzhenitsyn, who have found within religion an alternative system of values and ethics to that offered by communism. For the larger number of intellectuals motivated by an awakened nationalism, the church is the living inheritor and transmitter of the traditions of the past, and as such its architecture, art, music, literature, and, if necessary, even its belief must be preserved.

2. The Orthodox churches

Eastern Orthodoxy in its various forms has from 30 million to 40 million adherents in the Soviet Union. These include large numbers of Russians, Ukrainians, Belorussians, Moldavians, Georgians, Chuvash, Mordvins, Udmurts, Mari, and Komi, and smaller numbers of Estonians, Latvians, Tatars, Ossetins, Koreans, and other groups.

a. THE RUSSIAN ORTHODOX CHURCH—Far and away the largest group in Eastern Orthodoxy is the Russian Orthodox Church, whose fate and that of the Russian state have been interconnected for nearly a thousand years. The first contacts between the Eastern Slavs (Russians, Ukrainians, and Belorussians) and Byzantine Christianity were made through the Bulgarian Slavs in the eighth century. The ruling class began to adopt Christianity in the mid-ninth century, and the first mass conversion took place in about 860. Christianity and paganism coexisted until 988, when Vladimir, Grand Duke of Kiev (at that time the senior Russian ruler), declared Orthodoxy the official Russian faith.

The Russian church remained subordinate to the Patriarch in Constantinople for the next 500 years, but in the 13th and 14th centuries these ties were seriously weakened on the one hand by the Mongol invasion and isolation of Russia and on the other by the Western crusaders' seizure and temporary breakup of Byzantium. During this period the church rallied the squabbling Russian princes and persuaded them to accept the leadership of the Grand Duke of Moscow. At the same time the church began its successful mission to the pagan Finnic tribes on the fringes of Russian rule.

The Russian church came into its own in the 15th century, when it refused to follow the example of the Patriarch and the Emperor of Constantinople and sign an act of union with Rome in 1439. In 1448 the Russian church became autocephalous, determining its own affairs without reference to Constantinople and choosing its own Metropolitan (Archbishop). The fall of Constantinople in 1453 convinced the Russians of the rightness of their decision. To their mind Moscow

became the center of Orthodoxy, the last refuge of the unaltered faith, the "Third Rome," replacing Rome and Constantinople as the "City of God."

A conflict arose in the early 16th century between advocates of a more spiritual religion and those of a centralized, power-oriented persuasion. The latter won out, and in the late 16th century the Metropolitan of Moscow assumed the rank of Patriarch. However, the seeds were sown for schism. After a series of reforms were introduced in the mid-17th century in an attempt to bring Russian ritual into line with that of the Greeks, the church split, leading to the formation of the various sects of Old Believers or Old Ritualists.

From this point the Russian Orthodox Church fought and lost a series of battles with the state. The office of Patriarch fell vacant in 1700 and was finally abolished by Peter I in 1721. The church was governed instead by a Holy Synod consisting of bishops named by the tsar and chaired by a high lay official. Throughout the rest of the imperial period the church functioned as a department of the government, losing to the state most of its economic wealth in the form of extensive lands in the 18th century. Concurrently its priests steadily declined in social status, so that by the early 20th century their station in Russian life was analogous to that held by petty officials and policemen.

Following the revolution of 1905, the Russian Orthodox Church underwent a great intellectual and spiritual revival, and sentiment developed within the church favoring separation of church and state. When the imperial regime collapsed, the church responded by calling a council for August 1917, simultaneously democratizing the internal structure of the administration. After 3 months of wrangling, finally terminated by the fact of the Bolshevik Revolution, the church council elected a Patriarch, Tikhon. Unfortunately, the great revival of Orthodox Christianity clashed head-on with revolutionary communism, and the church soon found that its adversary's intention was its complete annihilation.

In swift succession the church lost the remainder of its landed property, its churches, monasteries, and schools, its status as an established church, its very corporate existence. Many of its leading clerics were arrested, exiled, and, in some cases, executed. Even the Patriarch was not spared, being jailed from 1922 to 1923. At the same time the regime promoted a schism within the church leading to the creation of the Living Church and other groups to challenge the authority of the Patriarch, and it also disseminated Evangelical Christian and Baptist propaganda to help weaken the church at the local level. Following the Patriarch's release from jail, the church announced that it would no longer oppose Soviet power, and for this the regime withdrew its support of the various schisms and sects.

Following the death of Tikhon in 1925, the office of Patriarch remained vacant for 18 years. At the height of the war Stalin allowed a council to be convened to fill the office. The new Patriarch, Sergey, died within a year, and in 1945 a successor, Aleksey, was elected. The

latter served until his death in April 1970; since that time the office has been filled by a *locum tenens*, Metropolitan Pimen of Krutitsy and Kolomna, whose see includes Moscow.

While there is ample precedent for the *locum tenens* to be selected as the next Patriarch, there are signs that this will not be accomplished without protest, which, if not satisfied, could create a crisis in the church's internal life and in its relations with the state. To a highly vocal minority in the church, Pimen has come to symbolize the alarming tendency of most high Orthodox churchmen to go beyond simple appeasement of the authorities, such behavior during the period of heightened oppression (1959-64) even verging on the suicidal. Since the mid-1960's a number of protesters, the most prominent among them Archbishop Yermogen of Kaluga, have addressed appeals to the Patriarch, the Soviet President, foreign church leaders and organizations, and the United Nations detailing their discontent with the continued violation of constitutional guarantees of freedom of worship and other laws concerning religion. Increasingly this protest movement has joined its small voice with that of the intelligentsia, the principal link being the church publicist A. Levitin-Krasnov, who made the initial connection by contributing to the underground publication *Phoenix* 1966 and who has subsequently taken part in several protests against specific acts of the regime. The church response to this protest has been to suspend dissenting clergymen from their functions while denying the truth of the various charges levied against it.

The Patriarch exercises supreme church authority when the church council is not in session. The church council, which consists of bishops, clerics, and laity and is convened only when necessary, is theoretically the highest authority in theological and administrative matters and is charged with electing a Patriarch within 6 months after the office is vacated. The council last met in 1945 to elect Patriarch Aleksey, and is scheduled to meet in May 1971 to elect his successor.

In 1945 the council drew up regulations for administering the Russian Orthodox Church. These regulations vest governing power in a 10-man Holy Synod consisting of the Patriarch, the Metropolitans of Leningrad-Ladoga, Kiev-Galicia, and Krutitsy-Kolomna (including Moscow), three bishops drawn in rotation from the dioceses of the church, two administrators of the Moscow Patriarchy, and the chairman of the department for foreign ecclesiastical relations of the Patriarchy. Theoretically, the 1945 regulations can be changed only by a regularly convened church council. In response to government pressure, however, the Patriarch circumvented this rule by convening an irregular council of bishops in 1961 to amend the regulations so that priests would no longer be able to take part in the administrative side of parish life. Both the content of the change and the illegal manner in which it was carried out helped to crystallize the opposition noted above.

The Russian Orthodox Church is divided into 73 dioceses, whose boundaries coincide with Soviet administrative divisions. Each diocese is normally headed by a bishop, who is elected by the Holy Synod and who administers the affairs of his diocese with the aid of a council consisting of from three to five persons. At present there are only approximately 60 bishops in office; the vacant sees are headed by *pro tem* clerical administrators. The bishop ordains priests and deacons for his diocese and appoints the various parish officials. The parishes are nominally headed by the priests and the general parish assembly. The latter elects the church council as the actual executive body for the parish. The church council is responsible for managing the church funds, which consist of voluntary offerings at divine services; payments for communion bread, candles, and other ritual accessories; and special donations for the needs of the church.

To staff the church a number of theological academies and theological seminaries have been allowed to function since 1944. Theological academies and seminaries are currently operating at Zagorsk (near Moscow) and Leningrad, and there is a seminary at Odessa. Seminaries also functioned for varying intervals between 1944 and 1966 in five other locations (Saratov, Stavropol', Kiev, Lutsk, and Zhirovitsy, near Minsk). From time to time permission is granted for study at overseas Orthodox centers such as Mount Athos, in Greece.

Although the church has no printing press of its own, it has secured permission to issue a monthly review, the Russian-language *Zhurnal Moskovskoy Patriarkhiy* (Journal of the Moscow Patriarchate). The number of copies per issue is not known, and no provision is made for its sale or subscription. For propaganda purposes a high proportion of its press run is sent abroad. Under the auspices of the Ukrainian Exarch (the Metropolitan of Kiev-Galicia) the church also issues for a readership largely made up of former Uniates the monthly Ukrainian-language *Pravoslavniy Visnik* (Orthodox Herald). Since 1942 the sum total of the Patriarchate's publications has amounted to some 15 works devoted to contemporary problems, at times approaching political propaganda (the position of the church, materials related to international meetings, speeches for the promotion of peace, etc.), a dozen liturgical books, the Bible (25,000 copies in 1956), the Gospels, the sermons of the Metropolitan Nikolai, and three numbers of a periodical review of theology. It was announced in June 1970 that a new edition of the Orthodox Bible had been printed, but there is no information on the size of the press run.

The influence of the Russian Orthodox Church extends beyond the borders of the Soviet state, as the church has dioceses in Canada, France, Austria, Israel, and other countries. In an apparent change of policy, however, the Russian Church gave up its control over its dioceses in the United States in early 1970, asserting that they should form the nucleus of a distinctly

American Orthodox Church in conjunction with the other ethnic Orthodox bodies on American soil.

Complicating the Russian Church's relations with the overseas Russian Orthodox churches are the frequent conflicts between clergy loyal to the Patriarch and schismatics who have split away at various points in the period since 1917, differences arising between anti-Communist emigre laymen and representatives of the Patriarchate, and the de-Russification as Russian Orthodoxy has taken root outside the Soviet Union. From 1943 to 1956 the Moscow Patriarch fought vigorously against these trends, and with tacit government support he sought to establish his primacy not only over the scattered overseas exarchates and dioceses that once had connections with the Russian church but also over the autonomous and autocephalous Orthodox churches of Eastern Europe. To this end, church leaders obtained permission for numerous trips abroad, at a time when such opportunities were open only to a very small number of top government officials. In the process, the representatives of the Russian Orthodox Church clashed with those of the Ecumenical Patriarch in Istanbul, and after 1948 with those of the Patriarch of Serbia; as a result an intra-Orthodox cold war developed which had many similarities to the larger conflict.

The first steps toward a more normal relationship between the Orthodox churches was made in 1956 when the Moscow Patriarch made his peace with the Serbian and Ecumenical Patriarchs. In the following year the Moscow Patriarch announced his willingness to wipe out all canonical disputes with other Orthodox churches, including the churches of the emigration. At about this time the Russian church also made its first approaches to the ecumenical movement, abandoning first its strictures against the Protestants and subsequently its denunciations of Rome. Contacts were established with the World Council of Churches in 1958, and the Russian church was accepted as a member in 1961. In that same year the Russian church accepted Rome's invitation to send observers to the opening session of the Vatican Council. Paradoxically, this acceptance came during the 1959-64 period, when the internal activity of the Moscow Patriarchate was at a postwar low because of official restrictions.

b. THE GEORGIAN ORTHODOX CHURCH—The existence of the autocephalous Georgian Orthodox Church contravenes a basic principle of Eastern Orthodoxy—that the jurisdiction of each Orthodox church is based on the state boundaries of the nation within which it functions. Thus, in the 1920's the Russian Orthodox Church fought and won a lengthy battle against autonomist and autocephalous trends which had arisen in the confused postrevolutionary years in Belorussia and the Ukraine. In 1940 and again in 1944, the Russian church reasserted its control over the autocephalous Orthodox churches in the formerly independent Baltic republics, the formerly Polish-ruled areas of Belorussia and the Ukraine, the formerly Czech-ruled Transcarpathian Ukraine, and the formerly

Romanian-ruled Moldavia. The Russian church went one step further in the territories and reversed the 1596 union between the church of Rome and the Orthodox churches in western Belorussia and the western Ukraine. The latter churches, variously styled Uniate, Greek Catholic, and Catholic of the Slavo-Byzantine rite, were the subject of constant Russian official and church pressure in the late 18th and 19th centuries. The Uniate churches revived following the 1917 revolution but were again suppressed in the 1920's, and following World War II the Russian Orthodox Church, with Soviet backing, presided over the liquidation of these churches in their overt form on Soviet territory.

The Georgian Orthodox Church, which traces its origins back to approximately 330, became autonomous in the sixth century and autocephalous in the eighth. It developed its own Georgian liturgy and had only sporadic contact with Russian Orthodoxy before Georgia was incorporated piecemeal into the Russian empire in the late 18th and early 19th centuries. With this political absorption came a gradual Russification of the Georgian Orthodox Church, and the Georgians by degree drifted away from their traditional Orthodoxy. In 1917, however, the resurgent Georgian church again declared its autocephaly and elected a Catholicos (Patriarch) to lead it. The Russian church refused to recognize this step until 1943, when as part of its deal with Stalin reviving its organization, it conceded the autocephalous status of the Georgian church.

Despite the normalization of its canonical status, the Georgian church has not returned to the same degree of health as the Russian church. With perhaps as many as 1 million communicants, the church has fewer houses of worship and priests than an average Russian Orthodox diocese. There are seven bishops, only three of whom are in charge of dioceses. Publication activities are limited to a liturgical calendar, and although the Georgian Orthodox Church is reported to have a seminary, no recent discussion of the school's activity has come to light. Since 1960 the church has been headed by Catholicos Efrem II, who was elected by a Georgian church council, and since 1962 it has belonged to the World Council of Churches.

c. THE OLD BELIEVERS—The Old Believers, or Old Ritualists, occupy a unique position, standing apart from both the official Orthodox church and from the mass of groups usually termed sectarians. They came into being in the Great Schism of 1666 as a national conservative Russian opposition to an Orthodox church which, under Greek influence, had supposedly distorted the ancient rites and liturgical books of Russian Christianity. The Old Believers are not a single church group but encompass a large variety of religious opinions. By the end of the 17th century they had split into two groups, the Priestists and the Priestless, over the question whether to retain the priesthood and the other sacraments. Both groups subsequently underwent numerous additional splits. Estimates of the total number of their adherents vary widely, but most

estimates fall between 1 million and 2 million. The bulk of Old Believers live in the European part of the U.S.S.R.

The largest group of Old Believers is the Belo-Krinitza Concord, a Priestist group formed in Austrian Bukovina in the mid-19th century. This group has a hierarchy with an archbishop in Moscow and five dioceses. It is governed by a council, and between sessions by an archepiscopal council. The Church of the Belo-Krinitza Concord is the only religious group in the U.S.S.R. to own its own printing press, demonstrating the reluctance of Old Believers to entrust the printing of their books to atheist or, even worse, to Orthodox printers. Their publishing output is quite limited, however, with only church calendars, ordinals, and prayer books having appeared since the war.

The church of the Belo-Krinitza Concord has never been recognized by all Priestist Old Believers. Even after its hierarchy had come into being, a group of Priestists persisted in resorting to runaway priests from the Orthodox Church. This group is called the Church of the Fugitive Priests, or, more formally, the Old Believer Church of Ancient Orthodox Christians. In the confusion of the 1920's this church enlisted the aid of a defecting Orthodox bishop and created its own hierarchy. It is headed by an archbishop with his see in Moscow, but, because it issues no publications, little is known of its activity or strength.

The Priestless Old Believers have never inclined toward firm organizational ties, and the effect of religious persecution has been to encourage their natural tendency to split into ever smaller groups. The most important of these groups are centered in Moscow, Latvia, and Lithuania, the Lithuanian group sometimes being referred to as the Eastern Orthodox Church of the Ancient Rite. The Moscow group has published a church calendar, but, even so, little is known of Priestless activities.

3. Other Christian churches

a. THE EVANGELICAL CHRISTIAN BAPTIST CHURCH—Perhaps the most widespread of the non-Orthodox churches is the Evangelical Christian Baptist Church, the product of a "voluntary" union in 1944 of the Evangelical Christians and the Baptists, with the Pentecostals joining in 1945 and the Mennonites in 1966. Large numbers of each of these constituents either have refused to enter this government-sponsored union or have subsequently seceded, so that the Communist effort to establish a "clarification on the religious front" by the absorption of smaller groups and sects into easier-to-control larger bodies has had only a mixed success. If the united church resolves its internal difficulties, the regime's effort to improve control of the non-Orthodox Christian sects may boomerang, in that the regime may instead become the godparent of a viable and vital organization spreading throughout the country, absorbing not only the isolated Protestants of Western and Russian origin but also groups of Orthodox and Old Believers hungry for religion and unable to find

it locally in their own faiths. In addition, the fervor and strict morality of the Evangelical Christian Baptists' belief has proved attractive to numerous young Soviet citizens with no religious ties who believe in the ideals of communism but find the reality wanting.

The Evangelical Christians trace their origins to English missionary work among the Russians in the latter half of the 19th century, while the Baptists derive from the adoption of German Protestant forms in the Ukraine in the mid-19th century. Many Russians and Ukrainians were particularly influenced by the Mennonites, members of a German evangelical sect granted refuge in Russia in the late 18th century, who in the late 19th century gradually began to adopt Russian as the language of prayer and everyday life. Another group influencing the spread of the evangelical movement and receptive to Evangelical and Baptist preaching was the Molokans (Spiritual Christians), a Russian sect formed in the late 18th century. They place great stress on the Bible and have tenuous inspiration from the Quakers. Two other evangelical groups are the Pentecostals, introduced into Russia by Americans in the early 20th century, and the Seventh-day Adventists, also spread from America but via German settlements in Russia in the late 19th century, whose teachings tie in with traditions established by Russian sabbatarian sects of 18th century origin.

The Evangelical Christians and Baptists benefited in the 1920's from official toleration aimed at undermining the dominant Orthodox church. They spread throughout the country, printing several complete and partial editions of the Bible, hymnals, spiritual guides, and periodicals; organizing Christian collective farms; operating pastoral courses; and engaging in extensive youth work. The success of their efforts, combined with the restoration of a working relationship between the regime and Orthodoxy, brought a change in official attitudes, but despite this the groups continued to grow.

The most serious difficulty experienced by the church born from the merger of these two groups occurred as a consequence of the 1959-64 renewal of the campaign against religion. As noted above, the Evangelical Christian Baptist Church has experienced a series of fractures as various groups within its heterogeneous community split off in protest against particular policies or practices of the central organization. The most recalcitrant of these have been the numerous but isolated communities of "Pure" or "Free" Baptists, who maintained that they were free from submission to any religious hierarchy and to the Soviet authorities. Following the promulgation in 1960 by the Evangelical Christian Baptist Church—under heavy pressure from the regime—of new governing statutes which called for sharp reductions in church activity, many of the Pure Baptist dissidents coalesced in an Action—or Initiative—Group (from which they became known as *Initiationniki*), whose aim was both removal of these restrictions and general decentralization and democratic reform. Despite government harassment, including numerous arrests, the reform Baptists had

remarkable success in winning adherents from the parent group as well as from the population at large. The parent organization, seeing the Action Group undiscouraged by repression and becoming alarmed at the group's growing strength, decided to adopt some of the reformers' demands in order to avoid an irreparable split. The first effort, made in 1963, while significant in the extent of its concessions, smacked too much of an imposed settlement and ultimately failed. The Action Group, under increasing regime pressure, stepped up its own pressure on the parent organization, and in 1965 finally declared a schism. The Evangelical Christian Baptist Church, distressed at the hardening of the split and alarmed by the intensified government repression of the dissenters, sought to heal the division by making further constitutional concessions in 1966 and providing for increases in reform representation in central bodies. Although by now several thousand reform Baptists have served or are serving jail terms for their efforts and are convinced that there can be no accommodation with the central organization, the parent body persists in its conciliatory attitude, knowing full well that any permanent division will lead to its own eventual dissolution.

The Evangelical Christian Baptist Church is estimated to comprise at least 3 million members, who conduct as active a parish life as the law allows. The church is governed by an assembly of representatives which meets every 3 years, most recently in 1969. To govern the church between assembly sessions, this body elects an All-Union Council of Evangelical Christian Baptists, consisting of 25 members. The All-Union Council elects in turn a nine-member presidium. The presidium chairman since 1969 has been M. Ya. Zhidkov, son of one of the founders. To keep in touch with the All-Union Council, presbyters (pastors) elect senior presbyters at meetings at the regional and republic level. Presbyters are elected in turn by the local congregations.

The Evangelical Christian Baptists do not maintain a theological seminary in the Soviet Union, but permission has been granted to set up a correspondence course, and on occasion the government has allowed individuals to study at Baptist schools in the United Kingdom, Sweden, Canada, and West Germany. The church engages in an active publishing program, issuing the bimonthly periodical *Bratskiy Vestnik* (Fraternal Herald), as well as psalters, hymnals, and an edition of the Bible. The Evangelical Christian Baptist Church has been a member of the World Council of Churches since 1962, and it also belongs to the European Church Conference, the Baptist World Alliance, and the European Baptist Federation.

b. THE EVANGELICAL LUTHERAN CHURCH AND OTHER PROTESTANT GROUPS—The Evangelical Lutheran Church survives as the principal religion of Estonia and Latvia and as a minority religion in Lithuania. A large number of Germans and Finns in the Soviet Union are Lutheran in faith, but they lack access to organized

forms of their religion and have for the most part tended to drift into the Evangelical Christian Baptist Church.

The extensive network of Lutheran churches spread across Russia before 1917 was gravely damaged following the separation of Finland and the Baltic republics from the disintegrating empire, and the subsequent identification of the Lutheran Church in the 1930's with ethnic Germans and Finns, whose "mother countries" were hostile to the U.S.S.R., was sufficient ground for the government to dissolve the Lutheran parishes. Following the annexation of the Baltic republics in 1940, however, and then again in 1944-45, with the Soviet reoccupation of this area, the Soviet Union found itself with a compact Lutheran community too large to extirpate through deportation. At present there are perhaps 1 million Lutherans in the Baltic area.

The officially sanctioned Estonian and Latvian Evangelical Lutheran churches are headed by a consistory and a supreme church council, respectively, who elect their respective archbishops, Alfre Tooming (in 1969) and Gustav Turs (in 1959). Lithuanian Lutherans also manage their affairs through a consistory but have no clerics above the local level. There is a severe shortage of Lutheran pastors because of the large-scale flight to the West or exile to Siberia of many of their number in the mid-1940's and the closing down of the theological faculties in Estonia and Latvia. As a makeshift for theological training, the churches in the Baltic republics have instituted correspondence pastoral preparatory courses, and lectures are offered occasionally. Also, a few individuals have been allowed to study at theological schools in Western Europe. Publishing activity has been limited, but church calendars, a hymnal, a psalter, and an edition of the New Testament have appeared. Both the Estonian and Latvian Evangelical Lutheran churches have been members of the World Council of Churches since 1962 and also belong to the Lutheran World Federation and the European Church Conference.

There are other Protestant groups in the western border areas of the U.S.S.R. which have managed to hang on while their coreligionists in the interior have merged with the Evangelical Christian Baptists. Chief among these are the Reformed (Calvinist) Church, concentrated among the very small Hungarian population of the Transcarpathian Ukraine, and a minute Methodist community in Estonia.

c. THE ROMAN CATHOLIC CHURCH—Through Russia's territorial gains in the 18th century, Roman Catholicism became one of the major churches within the empire. Previously it had been regarded by the Russians as the militant and hostile church of their dangerous neighbors to the west. The various attempts made by Rome to encroach on the Russian Orthodox Church, first through Crusades led by the Teutonic Knights in the 13th century and then through more or less compulsory unions enforced upon Orthodox dioceses under the authority of the Polish crown, combined with the centuries of hostility, mutual excommunication, and anathema between Rome and Constantinople, all made

a deeply unfavorable impression on the Russian people and indeed sometimes produced a profound hatred of the "Latin heresy." This heritage, combined with the well-established hostility between Catholicism and communism, placed the Roman Catholic Church at a marked disadvantage after 1917. Having lost most of its territorial base following the separation of Congress Poland and Lithuania from Russia, the remnant of the church found its adherents among scattered upper class Russians, ethnic Germans and Poles, and Uniates of Ukrainian and Belorussian nationality. None of these groups could claim many friends in court, and the assault on the Roman Catholic Church leading to its virtual liquidation in the early 1930's passed without any notable clamor inside the U.S.S.R.

Once again the territorial changes of 1939-40 and 1944-45 brought new life to a church on the verge of annihilation. The Soviet acquisition of approximately 12 million Catholics of the Latin and Slavo-Byzantine rites, concentrated in the western parts of the Ukraine and Belorussia, in Lithuania, and in southeastern Latvia, changed the position of the Roman Catholic Church from a small and scattered group to the third largest religion (after Russian Orthodoxy and Islam) in the U.S.S.R. The subsequent forced reunion of the Slavo-Byzantine Rite Catholics (Uniates) with the Orthodox Church and the repatriation to Poland of ethnic Poles has reduced the number of Roman Catholics to approximately 4 million persons, mostly in Lithuania and Latvia, with additional clusters in the western parts of Belorussia and the Ukraine and scattered groups in the R.S.F.S.R. Even though reduced by two-thirds, Roman Catholics still constituted the third largest religious group in the U.S.S.R. in 1970.

The Roman Catholic hierarchy outside of Lithuania and Latvia has been destroyed. Within Lithuania there are four dioceses and two archdioceses (Kaunas and Vil'nyus), but because of the regime's refusal to allow the consecration of new bishops, these are presently in the charge of apostolic administrators. The Bishop of Vil'nyus, Julionas Stepanovicus, has acted since 1959 as head of the skeletal Lithuanian hierarchy. Similarly in Latvia, which has one archdiocese (Riga) and one diocese, the affairs of the Roman Catholic Church have been in the hands of an apostolic administrator since 1962. The Roman Catholic churches allowed to function in Moscow and Leningrad are subject to the Riga archdiocese.

The number of Catholic churches and priests in the newly incorporated territories has been drastically reduced in the postwar period. During the early 1960's the seminary in Riga was closed down, leaving only one barely functioning in Kaunas. Soviet sources claim that permission has been granted to individuals to study at Saint Casimir University in Rome. Publishing activity is minimal, with the issuance of church calendars and a few prayer books reported. Contacts with Rome are nonexistent; when the Vatican Council opened in 1961, no Roman Catholics from the Soviet Union were present, in contrast to the observers sent by the Russian Orthodox Church.

d. THE ARMENIAN APOSTOLIC CHURCH—The Armenian church is perhaps the oldest Christian church on Soviet territory. Its origins go back to the beginning of the fourth century, when the King of Armenia was baptized and became the first monarch to decree Christianity as the religion of a whole nation. Actually a Christian community had already been in existence in Armenia for nearly a century. In the mid-fifth century the Armenian church refused to accept the decisions of the Council of Chalcedon, cutting itself off from the rest of Christianity, and from that point its fate and that of the Armenian people and nation were identical.

The authority of the Catholicos (Patriarch) of the Armenians, whose see is in Echmiadzin, was undivided until the mid-15th century, when a second Catholicosate was founded in Cilicia (present-day south-central Turkey). These two centers are independent of each other and have equal rights, but the Catholicos of Echmiadzin has a primacy of spiritual honor over that of the Great House of Cilicia (since the 1915-16 Turkish genocide, located in Lebanon), whose jurisdiction does not in theory go beyond the Middle East. Echmiadzin's jurisdiction extends not only over approximately 2 million Soviet Armenians but also over three-fourths (approximately 1.4 million persons) of the Armenians of the diaspora. The Soviet Government has always been conscious that its treatment of the church can influence the foreign Armenian communities, whose economic and political significance is not negligible. Thus, repression of the Armenian church has never been as rigorous as that of other religious groups in the U.S.S.R., and the Armenians, severely scarred by the brutality of the Turks in World War I, have been inclined to overlook the relatively milder Soviet transgressions.

The present Echmiadzin Catholicos is Vazgen I, elected in 1955 by a national church assembly. The Catholicos is assisted by a supreme church council in the administration of church affairs. The community of the monastery at Echmiadzin plays a part in the Armenian church similar to that of the Roman Curia, and it also runs a theological seminary and academy within its precincts. Both students and professors include Armenians from abroad. Only five of the 27 dioceses of the Armenian church are on Soviet territory, the balance located in such disparate places as France, Indonesia, California in the United States, and Iran. Most of the followers of the Armenian church in the U.S.S.R. outside the Armenian Republic are in adjacent Georgia and Azerbaijan and a number of cities in the R.S.F.S.R.

The Armenian church is allowed to publish a periodical, *Echmiadzin*, the bulk of whose press run is distributed abroad, and it also has issued church calendars, prayer books, and other religious literature. The ties of the Armenian church with overseas Christians are numerous. The Echmiadzin Catholicos has made several trips abroad and attended Armenian church conferences outside the U.S.S.R. Both divisions of the Armenian church entered the World Council of Churches in 1962, and the Armenian church also belongs to the European Church Conference.

4. The Jewish question

No universal agreement exists on the definition of the term "Jew," but in general Jews may be considered a religious group. Some Jews have put more emphasis on a national concept of Judaism, while others, not fully satisfied by either the religious or national definition, believe that something called a "community with a common history" might be more appropriate. In the Russian empire, Jews were considered both a religious group and an alien (*inorodnyy*) group ineligible for the civil rights granted other subjects. In the early Soviet period the Jewish religion came under attack, as did other religious groups, but the Jews were allowed to preserve their group identity through the formation of national districts in the Ukraine and Belorussia and an autonomous region in easternmost Siberia, Jewish collective farms, a flourishing Yiddish press, literature and theater, a network of Yiddish-language schools, and other vehicles of approved national expression. Such currents as the Zionist movement and the Hebrew language renaissance, which began in Russia and were flourishing on the eve of the revolution, were disapproved, however, and quickly suppressed.

The Russian attitude toward the Jews has generally been hostile. Small groups of Jews have been resident on Russian territory from time to time throughout the nation's history, but they were usually expelled during one or another of the Orthodox Church's crusades against Jews and "Judaizing" tendencies subverting the belief of the people. When large communities of Yiddish-speaking Ashkenazi (Central European) Jews came under Russian control as a result of the partitions of Poland (1772-95), a Pale of Settlement was established along the 1772 frontier barring Jews from moving into the interior. This restriction was later partly lifted in order to populate the Black Sea regions, however, and Jews with wealth and education were also allowed to settle in Moscow, Saint Petersburg (Leningrad), and other major cities. In the late 19th and early 20th centuries the government embarked on a campaign of conversion, emigration, or extermination of the Jews. It was at this point that the Russian term "pogrom" entered Western vocabularies. War and revolution dealt significant blows to Russia's Jewish community, both in terms of individual lives and religious and communal structure, and when the Soviet regime came to power, promising an end to anti-Semitism, it had no difficulty attracting the loyalty of the exhausted Jewish remnant.

An exception to this general experience is the fate of the Oriental Jews, who settled in the Caucasus, Crimea, and Central Asia 1,500 or more years ago and had become integrated into the surrounding societies, speaking only slightly Hebraized versions of the local languages as their secular tongue. These groups, after coming under Russian rule in the late 18th and 19th centuries, were undisturbed by the central government, and they had little or nothing to do with the majority Ashkenazi community. Since the advent of the Soviet

regime they have preserved their customs and institutions remarkably well, suffering little erosion in numbers (except for the small Crimean community, which was totally exterminated by the Germans in World War II), and they presently account for approximately 190,000 of the 2.2 million Jews in the U.S.S.R.

During the late 1930's many of the privileges granted the Jews as a nationality were withdrawn. Reeling from the blows suffered at the hands of the Germans in World War II, the Jewish community had to endure a virulent revival of anti-Semitism in the postwar period lasting until the death of Stalin. During this period prominent cultural figures as well as loyal Communists of Jewish origin disappeared, Yiddish-language schools, theaters, and publications were shut down, and Jewish religious life was reduced to a new low. As with other religious groups, the Jews were allowed to repair some of the damage in the mid-1950's, but new waves of anti-Semitism burst forth in the wake of Israeli successes in Sinai in 1956 and the gradual adoption by the Soviet Union of the Arab cause.

During the next decade, a trickle of Jews was allowed to emigrate as a means of removing troublesome individuals and potential leaders in the Jewish community. For the Jews left behind a handful of Yiddish books and a few Yiddish-language theatrical performances were permitted from time to time, mostly as a propaganda gesture. In 1961 a Yiddish literary periodical, *Soviet Homeland*, appeared, largely for foreign consumption. Yet at the same time scurrilous anti-Semitic pamphlets and brochures, newspaper articles, and books appeared under respectable auspices in the Soviet Union. A suspiciously high number of Jews were denounced in the press during the several campaigns against "speculation" and other economic "crimes," and an outburst of anti-Zionism with anti-Semitic overtones occurred following new Israeli successes against the Arabs in 1967. There is no question that this increased pressure on the Jews has stimulated some to try harder to "disappear" in the Russian majority, but at the same time this pressure has given rise to a highly vocal Jewish national movement among persons whose sense of Jewish identity had been only feeble. Neither trend can be quantified, but it is possible that the former is stronger, judging by the decline in the number of Jews from 2,268,000 in 1959 to 2,151,000 in 1970 and a corresponding decline in the proportion of Jews claiming a "Jewish" language as their native tongue from 21.5% to 17.7%.

Throughout these vicissitudes the life of the Jewish religious community has been feeble, and, if anything, it has grown feebler in the postwar period. It is estimated that there are about 500,000 Jews conscientiously practicing their religion, for whom there are fewer than 70 synagogues, most of them without rabbis. A theological seminary (*yeshiva*) barely functioned from 1957 to 1964, and most of its few students were Georgian Jews, whose religious life is still

secure. After a 5-year hiatus, the *yeshiva* has reopened, but the level of its functions remains minimal. Circumcision and the kosher slaughter of livestock and fowl have been banned or discouraged sporadically since the 1920's, although both are still carried out surreptitiously. A small number of prayer books were allowed to be published in 1956 and again in 1968, but foreign visitors attest to their inadequacy in meeting congregational needs; the manufacture or import of religious articles such as prayer shawls and phylacteries continues to be banned. Periodically in the 1920's and 1930's and from 1957 to 1967 the religious community was subject to further humiliation while the Soviet regime debated whether to allow the manufacture or import of matzoh for the celebration of the Passover. Since 1967, permits to bake matzoh have been issued; these have been insufficient to meet total demand but enough to undercut the spate of unfavorable publicity evoked by absolute refusal.

In comparison with other religious groups, the Jewish communities in the Soviet Union are relatively isolated from each other. No central organization exists; except for a rabbinical assembly specially convened in early 1971 to counter Western charges of Soviet anti-Semitism, conferences of rabbis have been banned since 1926. There is no Jewish religious periodical; and, as a rule, contact is not allowed with foreign Jewish communities, save in the rare instances when the Chief Rabbi of Moscow, Yehuda-Leib Levin, is paraded abroad to demonstrate the well-being of the Jewish religion in the Soviet Union. Yet despite these disabilities, the various congregations manage to communicate with each other and with the outside world by way of an informal grapevine fostered by the individual contacts made by travelers.

As an organized religious community, the Jews of the Soviet Union have a bleak future. Of the many young Jews intensely interested in Jewish culture and history, few are religious believers. The crowds who dance in the street near the synagogues on the holiday of Simchat Torah do so not as an expression of religious faith but as an affirmation of national identity. This sense of Jewish nationalism has been reawakened among Soviet Jews, many of whom have no other tie with the world Jewish community than the notation "Jew" in their internal passports, by the constant Soviet attacks on Zionism and Israel, as well as by the 20-year Israeli struggle to maintain its independence. Paradoxically, communism, which started out in Russia by announcing its intention to destroy the twin "evils" of anti-Semitism and Jewish nationalism, thereby attracting to its cause many secular Russified Jews (Trotsky, Sverdlov, Zinov'ev, Kamenev), and which subsequently used one of these evils as a club against the other, has in the process kept both alive.

5. Other religions

The Soviet Union has within its frontiers a sandheap of minor Christian and quasi-Christian sects,

Shamanism, the Baha'i faith, Karaism, Zoroastrianism, and other religions—everything except Hinduism. The two principal non-Western religions within the U.S.S.R. are Islam and Buddhism.

a. ISLAM—After the Russian Orthodox Church, Islam has the greatest number of followers, religious leaders, and places of worship. There are an estimated 15 million to 20 million Muslims concentrated in the republics of Central Asia, adjacent Siberia, the central Volga regions, and the Caucasus. Approximately 10%, located mainly in Azerbaijan and Dagestan, are of the Shia branch of Islam. These consider Ali, Muhammad's son-in-law, as the first rightful successor of Muhammad and do not acknowledge the Sunna, or body of traditions respecting Muhammad. The balance are of the Sunni branch, who acknowledge the first four caliphs to be the rightful successors of Muhammad and accept the "six authentic books" of tradition. A small community of Ismailite Muslims loyal to the Aga Khan are found in the mountainous southeast border regions of Tadzhikistan.

The Muslims of the U.S.S.R. were converted to Islam mainly between the 7th and 13th centuries, with additional conversions as late as the 18th century. For the most part Turkic-speaking peoples, they came under Russian rule beginning with the conquest of Kazan' in the 16th century and ending with the annexation of the protectorates of Khiva and Bukhara in the early 20th century. The Russian conquest encountered fierce resistance, rooted in the doctrines of Islam which prescribe opposition to regimes of another faith. A particularly bloody struggle against the Russians was conducted in the Caucasus under the leadership of the fanatic Muridist sect. This struggle lasted for 80 years, 25 under the famous Shamil, who still haunts Communist ideologists unable to decide whether he was the leader of a national independence struggle or a reactionary, feudal, religious figure.

When it annexed the Muslim areas, the tsarist government declared the inhabitants subject to the laws of the empire, regardless of their national and cultural characteristics, but left them their religion, which could be preached freely. The Muslim religious law, known as the Shari'ah, was also left undisturbed. An ecclesiastical administration was formed to protect Muslim rights. Muslim seminaries (*madrassahs*), in which religion was freely taught, were preserved, but the teaching of national languages in secular schools was eventually forbidden.

During the first 10 years of its existence, the Soviet regime was quite circumspect in its treatment of Islam. Not only did the regime wish to appease the Muslims so that it could solidify its control of their territory, but it also hoped to impress favorably other peoples of the East, largely living under British and French rule at that time. By the late 1920's, however, the regime felt sufficiently confident to introduce the same antireligious measures it had applied elsewhere. Religious schools were closed; religious law was abolished except

in the narrowest ecclesiastical sense; the Arabic alphabet and the study of the Arabic language were banned; and charitable foundation (*vakif*) property was confiscated. In addition, numerous mosques and *madrasahs* were closed, the clergy was arrested and deported, and the central Muslim ecclesiastical administration was dissolved.

With the general revival of religion in 1943, Islam was able to repair some of these losses. Four Muslim ecclesiastical administrations, selected by congresses of community representatives, were set up: in Ufa, covering the European regions of the U.S.S.R. and Siberia (headed since 1951 by Mufti Shakir Hialitdinov); in Tashkent, covering Central Asia (headed since 1957 by Mufti Zia-ud'din Babakhanov); in Baku, covering the Transcaucasus (headed since 1956 by Sheikh-ul-Islam Movsum Hakim-Zade); and in Buynaksk, covering the North Caucasus and Dagestan (headed since 1952 by Mufti Mohammed Hajji Kurbanov). Mosques were reopened, as were *madrasahs* in Bukhara and, for a brief time, in Tashkent. Individuals have also been allowed to continue their studies in Cairo and Fez. Editions of the Koran were printed in the 1950's, mostly for foreign consumption; a small number of believers were allowed to make the hajj (pilgrimage) to Mecca; and it was acknowledged that ritual practices such as circumcision, the giving of Muslim names, and religious marriages and funeral ceremonies persisted.

Russia has been longer and more closely in touch with Muslim peoples than any other European state. For over 200 years Muscovy was ruled by Islamized Mongols; from the middle of the 16th century the Tatar Khanates of Kazan' and Astrakhan were an integral part of Russia; and from the 18th century onward the frontiers of the Russian state actually marched with those of the two principal independent Muslim states—Turkey and Persia. This long and frequently antagonistic experience has served to produce in the mind of Russia's rulers an attitude toward Islam which can be described as a mixture of suspicion and aversion.

Tsarist governments regarded Islamic culture and society with barely concealed contempt, but their attitude toward Muslim religious practice and education was, if anything, more tolerant than toward those of the Jews and the dissenting Christian sects. The Soviet attitude toward Islam has resembled that of the tsarist regime in that it began by grossly underestimating the staying power of Islam. The Communist Party believed that the influence of Russian culture, combined with the benefits conferred by socialism, along with secular education, cultural regimentation, and antireligious propaganda—as well as coercive measures—would soon win the day. Like its tsarist predecessors, however, the Soviet Government has realized that results have fallen far short of expectations and that Islam is much more strongly entrenched than the Communists had initially believed.

b. **BUDDHISM**—Buddhism spread into the territories now occupied by the U.S.S.R. in the 17th and 18th

centuries in the form of Lamaism, the so-called Yellow Cap sect of Buddhism. The peoples adopting this religion were the Mongol Buryats and Kalmyks, and the Turkic Tuvinians. The Russian Government recognized the religion as early as 1741, when it created the Bandido Hambo Lama to head the Buddhist hierarchy in the empire. The number of temples, monasteries (*datsans*), and clergy (*lamas*) grew rapidly throughout the next century, until the government became concerned about their proliferation and placed a ceiling on further growth.

Following a period of relative toleration in the 1920's, the Buddhist religion suffered all the vicissitudes experienced by the other religious groups in the U.S.S.R. in the 1930's. On the eve of World War II, organized Buddhism was on the verge of extinction. The small (approximately 400,000) Buddhist community received a major blow when the Kalmyk nation was deported to Siberia in 1943 and its cultural life snuffed out following charges of collaboration with the German invaders. During the war the Buddhists did not seem to benefit from the general easing of conditions afforded other churches.

Only after several Buddhist nations became independent did the Soviet regime decide to improve its image by allowing a slight renewal of religious life to its own Buddhists. The Kalmyks were allowed to return home in 1958, but there were no traces of their traditional religion left in their home territory. Even the Buryats, who had been left relatively undisturbed, could not revive more than a remnant of their religion, as all the monasteries, books, icons, statues of Buddha, and various church vessels had been destroyed in the antireligious frenzy of the late 1930's. It is reported that one or two *datsans* were functioning in the early 1960's.

A Buddhist Central Council, as well as a Soviet Buddhist Monks Society, both headed since 1963 by Bandido Hambo Lama Jambal Dorji Gamboev, resident at Ivolginsk, is said to exist. There is some question, however, as to what there is for the Hambo Lama to do, other than to travel abroad to meetings of the World Fellowship of Buddhists or to be shown off to foreign coreligionists.

G. Education

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1. Education in national life

a. **THE ROLE OF EDUCATION**—One of the major problems facing the Soviet Government after the revolution and civil war was the rebuilding of the educational system. The spirit and character of the system which has subsequently developed are almost wholly alien to the tsarist educational tradition. The Soviet educational system is distinguished from its predecessor by its mass character and by the fact that it is totally state controlled, Communist oriented, and nationally planned. On the other hand, it resembles its predecessor in terms of its quality and the status granted by society to those educated in the system.

Since its earliest days the Soviet regime has attached great importance to the development of an educational system designed not only to educate effectively the youth of the country but to imbue them with loyalty to the regime and create acceptance of the officially prescribed ideological, moral, and social standards. One of the ultimate goals is the creation of the "new Soviet man," a skillful, tireless, and efficient worker who will treat labor as a matter of honor and social duty, will value the public interest above all, even though it may not coincide with his own desires, and will be ready to give his life in defense of the Soviet motherland against "imperialist aggressors."

Long after the completion of formal education, the process of molding the individual into the official pattern continues through organizations such as the trade unions and through the constant pressure of the officially controlled information system. Even an informal group such as the "collective"—the entire body of workers in a plant, children in a school, or residents in an apartment building—is drawn into the educational process. In theory at least, a "collective" exercises social pressure on its individual members to train them for conformity with official standards.

Although Soviet propaganda stresses the unquestionably real and considerable increase in educational opportunities open to the individual since the revolution, utility to the state is a much more basic purpose of the educational system than is benefit to the citizen. Prestige and rewards vary greatly with the level of education attained and with the importance attached by the state to particular fields of educational endeavor, however, and this provides a marked incentive to the citizen to follow the state's wishes.

Education provides a means of escape from the ranks of unskilled laborers, ordinary factory workers, collective farmers, and other groups with similar low living levels. For the children of the more privileged classes, education is a means of maintaining their social position. The concept of education as a means of individual social advancement and material gain does not necessarily exclude other, less utilitarian aspirations. Certain truly gifted scholars, deeply interested in the pursuit of knowledge for its own sake, have been able to find ample scope for this in the Soviet system in many fields where their discoveries can be of ultimate value to the state.

Despite their otherwise privileged status, educated persons as a group do not exercise direct political power, because the seat of such power remains in the central agencies of the Communist Party. During the early years of the Communist regime, when trained technicians were rare and great stress was placed on political reliability, persons with little formal education but zealous in the Communist cause were frequently placed in positions of responsibility in economic management or administration after hasty training in a given specialty. A number of the present leaders of the party and government owe their advancement to

successful handling of such assignments. As the Soviet-created educational system has trained new generations of specialists, and as new party officials are no longer drawn from a largely uneducated population, such positions are filled on the basis not only of party standing but also of professional qualifications acquired through education. Since advancement within the party frequently follows achievements in administrative positions, it appears that a regular higher education has become increasingly important to the politically ambitious.

By and large, the educational system has developed sufficiently to meet at least the minimum existing demands of national life for trained professional and semiprofessional manpower, although not all shortages have been eliminated. The quality of Soviet graduates is more difficult to estimate than their quantity. Most of them probably have adequate qualifications for the specialized positions for which they are trained. Those specifically trained for research and development have shown a considerable amount of creative ability. However, the close control exercised by the party over all phases of education cannot help but interfere with the spirit of intellectual curiosity and innovation and thereby hinders scientific achievement, particularly in the social sciences and humanities.

b. LEVEL OF LITERACY AND EDUCATIONAL ACHIEVEMENT—According to the 1970 census, 99.7% of the Soviet population between the ages of 9 and 49 was literate. No figures were given for the literacy of persons 50 and older, most of whom would have completed their elementary education before the first five-year plan. Despite Soviet claims that the U.S.S.R. is essentially "a country of complete literacy," qualified observers have estimated that there may be as much as 5% illiteracy at the present time—relatively little in view of the disruption and great losses suffered by the citizenry in extended periods of war, famine, terror, and pestilence since 1913. The official Soviet version of the growth of literacy since 1897 is depicted in Figure 76.

The Soviet authorities in 1930 established 4 years of universal compulsory education for persons between ages 7 and 11, and, in 1949, 7 years for persons between ages 7 and 14. The requirement was lengthened by 1 year in the 1958 reforms and another 2 years in 1968, so that 10 years of education are now compulsory for all persons between the ages of 7 and 17. Figure 77 outlines the estimated and projected levels of educational attainment by persons 10 years old and over from 1950 to 1985.

As a general rule the urban population has a higher level of educational attainment than the rural population, and the peoples of the European areas of the U.S.S.R. a higher level than those of the Asiatic areas. Except in the category of completed higher education, women have more training than men. As of 1969, 48% of the students in higher educational institutions and 54% of those in specialized secondary schools were women. At the same time, women

FIGURE 76. PERCENT OF LITERACY IN THE 9-49
AGE GROUP, 1897-1970

POPULATION	BOTH SEXES	MALES	FEMALES
Urban and rural:			
1897.....	28.4	40.3	16.6
1926.....	56.6	71.5	42.7
1939.....	87.4	93.5	81.6
1959.....	98.5	99.3	97.8
1970.....	99.7	99.8	99.7
Urban:			
1897.....	57.0	66.1	45.7
1926.....	80.9	88.0	73.9
1939.....	93.8	97.1	90.7
1959.....	98.7	99.5	98.1
1970.....	99.8	99.9	99.8
Rural:			
1897.....	23.8	35.5	12.5
1926.....	50.6	67.8	35.4
1939.....	84.0	91.6	76.8
1959.....	98.2	99.1	97.5
1970.....	99.5	99.6	99.4

represented 58% of all "specialists"—i.e., persons employed in the national economy with a higher or specialized secondary education. The higher one goes on the educational ladder, however, the lower the proportion of women. Thus, in 1969 only 39% of "scientific workers"—i.e., persons employed in the national economy with an education beyond the first university degree—were women, and only 28% of all graduate students were women. In the same year women comprised 17% of all holders of the Candidate of Sciences (roughly equivalent to the American Ph. D.) or Doctor of Sciences (higher than the Ph. D.) degree.

In terms of the ratio between persons enrolled in primary and secondary schools and persons either in the 5 to 19 age group or within the age group normally covered by this schooling, the U.S.S.R. lags somewhat behind the more advanced industrial nations. Figure 78 outlines school enrollment ratios in 1965 for the first and

FIGURE 78. SCHOOL ENROLLMENT RATIOS FOR THE
FIRST AND SECOND* LEVELS OF EDUCATION, 1965
U.S.S.R. AND SELECTED COUNTRIES, 1965
(Data from UNESCO Statistical Yearbook)

	SCHOOL ENROLLMENT AS A PERCENT OF 5-19 AGE GROUP	SCHOOL ENROLLMENT AS A PERCENT OF APPROPRIATE SCHOOL-AGE GROUP*
United Kingdom**....	88	102
United States.....	87	93
East Germany.....	83	103
West Germany.....	78	90
Japan.....	74	93
France.....	73	91
Poland.....	71	88
U.S.S.R.....	71	82
Yugoslavia.....	63	79
Italy.....	61	70

*Second level of education includes general and specialized secondary, vocational, and teaching training.

**England and Wales.

second levels of education in the U.S.S.R. and selected other countries. When one turns to enrollments in universities and other institutions of higher education and the number of graduates of these institutions, however, the U.S.S.R. ranks near the top of the list. In 1969 the U.S.S.R. had an enrollment of 4,549,600 students in its higher educational institutions, equivalent to 188 students per 10,000 population, and in the same year the number of graduates increased by 564,900, equivalent to 23 graduates per 10,000 population. Figure 79 compares the U.S.S.R. and selected other countries in terms of students per 10,000 population in 1966 and graduates per 10,000 population in 1965.

As for the various nationalities, the Soviet record in literacy and educational achievement is undeniably outstanding. Thus, the area now comprising the Central Asian republics of the U.S.S.R. had an average literacy

FIGURE 77. LEVELS OF EDUCATION AND THE NUMBERS AND PERCENTAGES OF PERSONS 10 YEARS OLD
AND OVER ATTAINING THEM, 1950-85
(Data from U.S. Department of Commerce; figures for levels attained are in thousands)

LEVEL ATTAINED	1950		1959		1970		1985	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Higher.....	1,915	1.3	3,778	2.3	*8,262	*4.2	15,208	6.5
Incomplete higher.....	881	0.6	1,738	1.1	*2,605	*1.3	7,691	3.3
Specialized secondary.....	5,006	3.4	7,870	4.8	*13,420	*6.8	25,408	10.9
General secondary.....	6,300	4.3	9,936	6.1	*23,391	*11.9	27,649	11.8
Incomplete secondary:								
(7-9.9 years).....	22,390	15.3	35,386	21.8	*47,368	*24.1	59,289	25.4
Primary and incomplete 7-year:								
(4-6.9 years).....	54,569	37.3	50,308	31.0	51,051	25.8	49,600	21.2
Less than primary:								
(0-3.9 years).....	55,414	37.8	53,448	32.9	53,156	26.9	48,698	20.9
Total.....	146,475	100.0	162,464	100.0	197,683	100.0	233,743	100.0
Median school years attained.....	5.0		5.7		6.7		7.9	

*Figures corrected to reflect 1970 census returns.

FIGURE 79. EDUCATION AT THE THIRD LEVEL:
STUDENTS AND GRADUATES PER 10,000
POPULATION, THE U.S.S.R. AND SELECTED
COUNTRIES, 1965-66
(Data from UNESCO Statistics Yearbook)

	STUDENTS 1966	GRADUATES 1965
United States.....	325	37
U.S.S.R.....	177	18
Japan.....	129	25
France.....	108	11
Yugoslavia.....	99	15
Poland.....	87	9
West Germany.....	71	11
Italy.....	66	6
United Kingdom**.....	65	18
East Germany.....	46	12

*Third level of education includes universities and other institutions of higher education.

**England and Wales.

rate for persons between 9 and 49 years of age of only 5% in 1897, but by 1959 this rate was 97%. Even allowing for some official optimism in census-taking, literacy in the area is probably over 90%. The 1897 and 1959 figures for the Caucasian republics were 14% and 98%. On the other hand, in some of the western borderlands a high level of literacy in the 9 to 49 age group was achieved well before the advent of the Soviet regime—Estonia reaching 96% in 1897 and 99% in 1939, while Latvia's corresponding levels were 80% and 93%. By 1959 both Estonia's and Latvia's literacy rates were almost 100%.

The number of enrolled students in the 7 to 17 age group has more than doubled in the Central Asian republics between 1940 and 1969, nearly doubled in the Caucasian republics, and risen by approximately 50% in the Baltic republics. By comparison, enrollments have risen only some 25% in the area covered by the Russian, Ukrainian, and Belorussian republics. Over the same period enrollments in higher educational institutions have roughly quintupled in the Baltic and Caucasian areas, and increased by a factor of 14 in Central Asia. Yet the latter area still has considerable ground to cover in the number of students and graduates per 10,000 population to catch up with the more developed regions of the U.S.S.R. Figure 80 compares the number of students per 10,000 population in each of the constituent republics of the U.S.S.R. in 1940 and 1969, with similar ratios for graduates in 1960 and 1969.

Though not uniformly enforced, and at times even disregarded, the Soviet constitution guarantees minorities the right of instruction in their own tongue, and such instruction may be extended to the secondary school and university level when there is a settlement of sufficient size to justify it. Members of minority groups have not been required to study Russian since 1959, but since key courses are frequently taught in this language for want of qualified native instructors, ambitious students have found themselves forced to enroll in Russian-language classes in order to get ahead.

FIGURE 80. HIGHER EDUCATIONAL INSTITUTIONS:
STUDENTS AND GRADUATES PER 10,000 POPULA-
TION, BY REPUBLIC, SELECTED YEARS

	STUDENTS		GRADUATES	
	1940	1969	1960	1969
R.S.F.S.R.....	43	204	17	25
Ukraine.....	47	171	16	22
Belorussia.....	24	153	12	20
Lithuania.....	20	178	12	21
Latvia.....	52	171	13	18
Estonia.....	45	166	16	19
Moldavia.....	10	127	10	18
Georgia.....	77	192	18	27
Armenia.....	82	214	17	25
Azerbaijan.....	44	194	14	24
Kazakhstan.....	16	152	11	18
Turkmeniya.....	22	135	14	17
Uzbekistan.....	28	194	16	23
Kirgiziya.....	19	158	11	19
Tadzhikistan.....	15	147	11	19
Total U.S.S.R.....	41	188	16	23

For many years the statistics of student enrollment in the Russian-oriented Soviet higher educational system demonstrated the cultural advantage enjoyed by native Russians, who were consistently overrepresented in comparison with their share of the total population; at the same time, however, these statistics revealed that a few of the minority nationalities, notably the Jews, Georgians, and Armenians, were able to overcome this disadvantage. In the past decade the Kazakhs and Azerbaidzhanis have, with the aid of a quota system protecting the interests of the principal nationalities in the non-Russian republics and a vastly greater birth rate and hence "younger" populations, are moving over into the "overrepresented" group, while the Uzbek, Turkmen, and Kirgiz groups apparently are about to do so. Those nationalities without a territorial base and therefore discriminated against in the quota system—such as the Jews—and those nationalities with increasingly "mature" populations in the demographic sense—for example, the Baltic peoples and indeed, over the long haul, the Russians themselves—have declining proportions in the school-age cohorts and will inevitably begin to show a decline in their share of the student enrollment. Figure 81 compares the composition of student enrollments in 1962 and 1969 with the composition of the total population according to the 1970 census.

2. Government and education

On the surface there is no central authority for education in the U.S.S.R. Elementary and general secondary education, as well as nurseries and kindergartens, are the joint responsibility of the national Ministry of Education and the various republic and autonomous republic ministries of education. Specialized secondary and higher education is the joint responsibility of the national Ministry of Higher and

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FIGURE 81. NATIONALITY COMPOSITION OF TOTAL POPULATION AND HIGHER EDUCATION ENROLLMENT BY PERCENT

NATIONALITY	TOTAL POPULATION 1970	STUDENT ENROLLMENT 1962	1969
Russian.....	58.4	61.3	59.7
Ukrainian.....	16.9	14.5	13.6
Belorussian.....	3.7	2.9	2.8
Uzbek.....	3.8	2.4	3.2
Tatar.....	*2.5	1.7	1.8
Kazakh.....	2.2	1.8	2.2
Azerbaidzhani.....	1.8	1.2	1.9
Armenian.....	1.5	1.5	1.8
Georgian.....	1.3	2.0	1.9
Lithuanian.....	1.1	1.1	1.1
Jewish.....	0.9	2.7	2.4
Moldavian.....	**1.2	0.5	0.7
Chuvash.....	0.7	0.4	0.3
Latvian.....	0.6	0.7	0.5
Tadzhik.....	0.9	0.5	0.6
Mordvin.....	0.5	0.2	0.2
Turkmen.....	0.6	0.4	0.5
Bashkir.....	0.5	0.3	0.3
Estonian.....	0.4	0.5	0.4
Kirgiz.....	0.6	0.4	0.5
Other.....	4.9	3.0	3.6
Total.....	100.0	100.0	100.0

*Includes both Volga Tatars and Crimean Tatars.

**Includes persons classified as Romanian.

Specialized Secondary Education and the corresponding republic ministries or committees. Vocational and technical education is within the realm of the State Committee for Vocational and Technical Education attached to the Council of Ministers of the U.S.S.R. Finally, the national Ministry of Culture and its republic counterparts as well as special committees attached to the Council of Ministers of the U.S.S.R. deal with matters which could be termed educational in the less formal sense (adult education, libraries, museums, theaters, the cinema, literature, radio, television, and the press). In practice, however, this lack of central authority makes little difference. The ministries and committees are merely executive bodies, with power residing, according to the constitution, in the Supreme Soviet and the Council of Ministers of the U.S.S.R. The latter are effectively controlled by the Communist Party central organs, which are the real source of policy in education as in other areas.

The powers of the national administration in the field of education are quite broad. It is at this level that the requirements of the national economic plan are translated into specific goals for the educational system, and it is also at this level that the educational budget is drawn up. The national authorities are empowered to define the general framework of public education, and they set the timetable for the development of the educational network. The republic and local authorities are responsible for the day-to-day administration of educational institutions and the supervision of

fulfillment of directives from the central authorities. The nationwide link and coordinator in the administration of education is the Communist Party. The farther down the chain one goes, the greater is the amount of detail laid down for the conduct of the schools. By the time one comes down to the teacher, the area of personal discretion is very small. Not only basic policy but the content of the curriculum, schemes of work, teaching methods, and the like are prescribed for the teacher in considerable detail.

One result of this system is a high degree of uniformity all over the country. As a result of a complex set of centrally decreed regulations, the schools, textbooks, curriculums, and teaching methods are closely similar throughout the U.S.S.R. With few differences, children in the same grade all over the country wear the same uniforms, observe the same rules of behavior, and study the same subjects from the same textbooks at the same pace. When they complete their compulsory education at age 15, the alternatives available for the next stage are substantially the same nationwide.

There are some variations, of course, official and otherwise. The main difference is one of language. Similar though they may be in other respects, the native schools in Tbilisi, for example, will give instruction in Georgian rather than in Russian. This in turn often leads to other changes because of the extra burden of learning Russian. In the Baltic republics children stay in school a year longer than their Russian counterparts largely for this reason. There are also minor differences in textbooks and curriculums from one republic to another. Textbooks in the non-Russian republics are frequently straight translations of those used in the R.S.F.S.R., but on occasion the republics have their own when local conditions make this necessary—as with the treatment of local history, for example. Further, official policy encourages the national cultures of the several minorities, so that such subjects as art, music, and literature are presented with a strong bias toward the national idiom.

Unofficially, too, there are breaks in the picture of nationwide sameness. Evasions of regulations are under constant fire in the educational press, which implies that such activity is commonplace. There is evidence that in some of the more remote areas, full teaching programs are not always realized because of a shortage of adequate facilities. The maximum size of classes tends to be an ideal rather than a reality. Official standards of building maintenance are not always observed. There are even instances of children being allowed to leave school and take jobs at age 14 or less, although the legal age for leaving is 15. In education, as in general living standards, there is still a marked disparity between town and country. Rural schools are usually much worse off than urban schools for buildings, equipment, and supply of teachers. Further, the choice of educational facilities is much more limited in the countryside, where nearly half the population of the Soviet Union still lives.

Financial support of the educational system is derived largely from the state budget of the U.S.S.R. In

addition, contributions are made by state, cooperative, trade union, and other public enterprises and organizations, as well as by collective farms. Furthermore, parents contribute part of the maintenance for their children in nurseries, kindergartens, and boarding schools. These funds are allocated as follows: 5% to national ministries of education and culture, 30% to the comparable republic ministries, and 65% to regional and local authorities, thus confirming the decentralization of day-to-day educational administration. In 1969 expenditures on education equaled approximately 8.5% of the national income. The following tabulation outlines the rise in funds spent on education in the U.S.S.R. since 1940, in billions of rubles:

SOURCE OF FUNDS	1940	1960	1965	1969 (preliminary)
State budget	2.2	8.0	13.2	17.4
Percent of total budget ..	12.3	10.9	13.0	12.6
Other funds	0.2	1.7	2.9	5.3
Total expenditures	2.4	9.7	16.1	22.7

3. Educational system

According to the constitution of the U.S.S.R., all Soviet citizens have the right to education. This right is

said to be insured by universal compulsory 10-year schooling, extensive development of a network of secondary and higher schools, distribution of schools of various types and purposes on a territorial basis, existence of evening and correspondence schools, free tuition and a system of state grants, instruction in the native language, and organization of free vocational, technical, and agronomic training in factories and on state and collective farms.

The Soviet school system is unified and continuous through all stages of public education. The interconnections of different types of schools are organized according to a single plan which in theory precludes the existence of dead-end schools, from which it would be impossible to go on to the next educational stage. Figure 82 depicts the main outlines of the educational system since 1966.

a. **PRESCHOOL INSTITUTIONS**—Preschool education in the U.S.S.R. is neither compulsory nor available to all, nor is it free. Nevertheless, it is expanding, and in some places it can take in the majority of eligible children. Further, Soviet educators increasingly stress the importance of expert preschool guidance to the child's development. Preschool institutions are of two

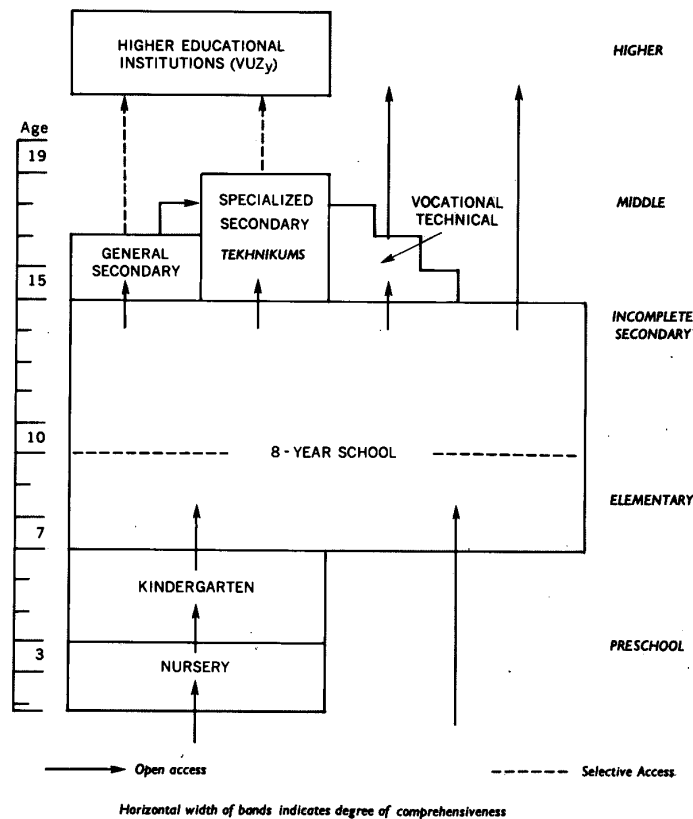


FIGURE 82. Soviet educational system (after 1966) (U/OU)

kinds: nurseries for children from 3 months to 3 years of age and kindergartens for children from 3 to 7. The following tabulation outlines the growth in the number of nurseries and kindergartens, their enrollment, and their personnel since 1940 (in thousands):

	1940	1960	1965	1969
Number of nurseries and kindergartens	24.0	43.6	67.5	80.7
Number of children enrolled	1,171.5	3,115.1	6,207.3	7,835.2
Number of personnel	75.2	243.4	453.3	557.2

Nurseries are often run by factories, offices, collective farms, and other enterprises for the children of their employees. Others are provided by the ministries of education and other public bodies. Most of these institutions, especially in the towns, operate all year round, but some are organized on a seasonal basis. Many collective farms find them necessary at harvest time, for example, when the mothers are required in the fields, but do not make provision for them the rest of the year. The nurseries are primarily concerned not with instruction but with the physical welfare of the children—seeing that they have healthy surroundings and medical care (doctors and nurses are usually on the staff) and acting as institutionalized babysitters in order to release the mothers for work. The activities in the nursery consist largely of supervised play and rest.

Kindergartens, like nurseries, are often provided by farms and industrial plants, though some are run by local departments of education. Factories and farms which provide kindergartens are responsible for their maintenance and repair, but they come under the jurisdiction of the educational authorities and are open to inspection and control. Hours tend to vary according to the parents' work schedule, but most kindergartens are open 10 to 12 hours daily, 6 days a week, to allow for differences in parents' shifts. Some children are boarders, going home only on the weekends. Apart from doctors and nurses, the staffs of these establishments are supposed to include teachers qualified in preschool work. Some of them have taken the full course at a teachers' college, but most are trained in specialized secondary schools where they receive a more modest preparation for the job. As in the nurseries, parents have to pay a fee as a contribution toward the children's upkeep. This varies a good deal from place to place and is adjusted to the parents' income, but generally it seems to range between 1.50 and 15 rubles per month. If parents are unable to pay, their trade unions contribute part or all of the cost. Despite the expense, there are far more applicants for kindergartens than there are places.

The curriculum of the kindergarten is more methodical than in the nursery program, but much less so than in the ordinary schools. The age range, 3 to 7, is fairly wide, and children are divided into junior (3-4), intermediate (4-5), and senior (5-7) age groups. Much of the time is spent attending to the children's health, making sure they have plenty of exercise, fresh air, rest, a balanced diet, and medical attention. The children

are regularly examined by the doctor; treatment is given when necessary, and those with severe defects are passed on to special schools for the handicapped. A good deal of trouble is taken to make the children health conscious by providing them with an elementary knowledge of health and training them in hygienic habits.

Elementary instruction is given in the artistic and, to some extent, the academic fields. Children are taught singing, dancing, drawing, modeling, and elocution. Older children are taught to read simple texts, to write the letters of the alphabet, and to count up to 10. In a few experimental kindergartens simple lessons in foreign languages are given, and the response of parents and teachers to this innovation has been enthusiastic.

Great though the demand is for preschool education, only a minority of children receive any form of it. The official goal is to make nurseries and kindergartens generally available, but there is little likelihood that this will be accomplished soon, as preschool education has the lowest priority in the allocation of resources.

b. THE 8-YEAR SCHOOL—This is the basic school for nearly all Soviet children. They enter on the first of September after their seventh birthday and stay until they have completed 8 full years. If they have had to repeat classes, they are allowed to leave at the end of the school year in which they reach the age of 16.

Prior to 1958 the basic school was a 7-year institution, divided into a 4-year elementary course and a 3-year incomplete secondary course. At age 14 pupils finishing the 7-year course could enroll in a 3-year general secondary course. The 1958 school reform revised the distribution of courses, and the result was an 8-year basic school comprising a 4-year elementary course and a 4-year incomplete secondary course. The general secondary course remained 3 years in length but was revised to include 1 year of "practical work" in industry or agriculture. This feature was immensely unpopular, however, and so in 1964 the year of practical work was dropped; further, the total elementary-secondary curriculum was reduced to 10 years. In 1966 another adjustment was made, reducing the elementary course to 3 years and increasing the incomplete secondary course to 5 so that pupils might receive more intensive instruction in academic subjects prior to entering the general secondary course.

Children in the elementary grades of the 8-year school are taught by a general class teacher for all subjects except physical education. From the fourth year onward they are taught by subject specialists. Each grade has a class adviser whose duty is to keep an eye on the welfare, progress, and behavior of the class in their schoolwork as a whole. The division into elementary and secondary grades is an internal convenience and does not imply any selection or transfer. Except for the very few children who transfer to special or boarding schools, the 8-year school takes the pupils through their course in the same building—coeducational, comprehensive, and unstreamed throughout. Soviet statistics

FIGURE 83. SCHOOLS, PUPILS, AND TEACHERS IN GENERAL EDUCATION, 1940-69

	1940	1960	1965	1969
Number of schools:				
Day.....	192	199	190	180
Night.....	7	25	24	17
Total.....	199	224	214	197
Number of pupils:				
Classes 1-4:				
Day.....	21,624	18,692	20,319	21,136
Night.....	107	55	71	45
Total.....	21,731	18,747	20,390	21,181
Classes 5-8:				
Day.....	11,979	13,189	18,221	19,683
Night.....	551	1,654	1,658	1,005
Total.....	12,530	14,843	19,879	20,688
Classes 9-10 (11):				
Day.....	1,181	1,536	4,870	4,566
Night.....	110	1,061	3,116	2,991
Total.....	1,291	2,597	7,986	7,557
Classes 1-10 (11):				
Day.....	34,784	33,417	43,410	45,385
Night.....	768	2,770	4,845	4,041
Total.....	35,552	36,187	48,255	49,426
Number of teachers:				
Day.....	1,216	1,933	2,366	2,491
Night.....	22	110	131	117
Total.....	1,238	2,043	2,497	2,608

treat the 8-year school and 2-year general secondary school as a unit. Figure 83 outlines the growth in the number of schools, pupils, and teachers in elementary and secondary general education since 1940. Included within these figures but not separately stated are extended day schools and boarding schools, which in 1969 had an enrollment of 5.5 million pupils, and schools for mentally and physically handicapped pupils, which in 1969 had an enrollment of 300,000.

The curriculum of the 8-year school is highly formal and academic, with subjects such as singing and drawing tending to drop out in the higher grades under the pressure of more academic studies. The general pattern is for the number of subjects to increase gradually as the course progresses. The 7-year-old comes to school in the first year for 4 hours a day, 6 days a week, from 1 September to 31 May (35 weeks, excluding vacations). Lessons normally last for 45 minutes. His time is spent on Russian literature and language (12 hours a week), mathematics (6), physical education (2), vocational courses (2), and music and drawing (1 each). By the time the child is in the eighth and last year, he is attending for an average of 6 hours a day, 6 days a week from 1 September to 25 June (39 weeks, excluding vacations). The time is spent as follows: Russian literature and language (5 hours), mathematics (6), history and civics (3), geography (2), foreign languages (3), physics (3), chemistry (2), biology (2), physical education (3), vocational courses (3), and "socially useful labor" (2). In the seventh and eighth years, 2 and 4 hours, respectively, are set aside for elective subjects.

For children whose mother tongue is not Russian, teaching is carried out in the national language, Russian normally being introduced as an additional subject in the second year. In theory Russians living

outside the R.S.F.S.R. and attending Russian-language schools must enroll in a national minority language course, but this regulation is honored more in the breach. Foreign languages begin in the fourth year for all children, with some experimental schools introducing the subject earlier. Most schools offer only one foreign language. By 1971 the Soviet regime hopes to have established the following proportions in foreign-language instruction: English, 50%; German, 20%; French, 20%; and Spanish and other languages, 10%.

The main change made in the curriculum by the 1958 reforms has been the greater emphasis on vocational training in all its forms. This was a feature of the pre-1958 schools, too, but it has been more sharply stressed. Vocational training begins in the first year with simple lessons in the manipulation of tools and materials—sewing, modeling, paper-cutting, etc. Carpentry with allied skills is introduced in the fourth year, and various mechanical skills are added later. There is less manual training of this kind for girls, who spend some of their time in the higher grades in home economics courses. Even so, the girls receive industrial manual training, and the boys appear to have some domestic instruction along with their practical work. This difference of degree in the time spent on industrial and domestic skills is practically the only concession made by the Soviet school to sexual differentiation. The fact that the girls almost certainly will be workers as well as wives and mothers is clearly a determinant.

There is no attempt in the 8-year curriculum to prepare the children for any particular occupation. By the end of the eighth year the pupils have all had some experience with woodworking and metalworking, with machine tools as well as handtools. They have had practice in the care of plants and animals on the school

plots or on visits to collective farms (or on their own farms, in the case of rural schools). More important, they have had instruction in the relevance of scientific theory to its practical use in industry and agriculture. Also, during the higher grades they have visited and done some work in different kinds of industrial enterprise, both as a part of their general experience of industrial production and as a means of helping them decide on the kind of job they would like to enter after leaving school.

Classes range in size between 20 and 40 pupils, and class instruction is supplemented by homework. In theory, homework is limited to 1 hour a night in the lower grades and 2 in the upper, but in practice this is exceeded in many instances, especially in the upper grades. Considerable emphasis is given to quizzes and tests; the results are graded on a 5-point scale, with "5" equivalent to the American "A." Those with year-end averages below "3" are given additional assignments and reexamined before the beginning of the new school year. Pupils failing this reexamination must repeat the grade.

Although the 8-year school and all succeeding schools are free, parents pay for their childrens' textbooks, materials, and uniforms. If they are unable to afford the expense, they can have these things provided free, the cost being met from a fund administered by the parents' committee at the school. The same applies to meal vouchers for the school dining room. Books are comparatively cheap, an average-size hardcover costing from 40 to 50 kopecks and paperbacks proportionately less. Uniforms do not appear to be compulsory, but the great majority of pupils wear them. Clothes are expensive in the Soviet Union, but the price of uniforms is held down. Quality varies, and many mothers prefer to make the uniforms themselves, using patterns provided free of charge by the school.

Compulsory schooling for the Soviet child ends with the eighth year. Approximately one-sixth of the graduating pupils leave for regular jobs at this stage, though many subsequently enroll in continuation classes later on. The rest continue their education at the different types of middle schools—the general secondary, the specialized secondary, and the vocational-technical schools, all of which offer courses of general education combined with technical and vocational training in varying degrees.

C. MIDDLE SCHOOLS

(1) *General secondary schools*—These schools provide a 2-year course, taking the student up to age 17, and are usually located in the same buildings as the 8-year schools. When this happens, the entire institution is referred to as a 10-year school. The length of the school day and school year and the methods of instruction, testing, and grading are the same as in the upper grades of the 8-year school. Not all pupils go straight from the eighth to the ninth grade, however. Many go into full-time jobs and study as they can at night or by

correspondence, while others take detours through specialized secondary or vocational-technical schools. Figure 83, above, traces the enrollment in the general secondary schools (class 9-10) from 1940 to 1969.

About three-fourths of the student's time in the general secondary school is spent on academic subjects. The range is much the same as in the upper grades of the 8-year school—Russian language and literature, history, social science, economic geography, a foreign language, mathematics, physics, chemistry, biology, astronomy, and mechanical drawing. A departure is the provision of 6 hours a week throughout the course of study for elective subjects, thus giving the students a chance to specialize further or broaden their curriculum on school time if they wish. Electives are offered in mathematics, physics (including specialization in electronics), chemistry (including specialization in chemical technology), biological sciences and agrobiology, and the social sciences (including literature and philosophy). No more than two electives may be taken in a given year. In addition, there is also an opportunity for accomplished pupils to adjust the general education curriculum so that their special aptitudes may be further developed. Thus, those who elect to follow a mathematics specialization may reduce the class time they spend on literature, history, or economic geography in favor of mathematics, while those who follow a humanities specialization may reduce class time spent on mathematics, physics, or chemistry in favor of humanities subjects. These students are expected to make up this reduced class instruction by outside study on their own, however, and they must take the same year-end examinations as their classmates.

For the very gifted pupil in the ninth and tenth grades, there are a few specialized schools with curriculums favoring either mathematics, the physical and natural sciences, foreign languages, or the creative and performing arts, such as music, drama, ballet, painting, and sculpture. The foreign-language and arts schools also offer specialized instruction to a rigorously selected number of elementary-level pupils. Competition for entry into the specialized schools is intense, and their graduates have a decided advantage over other children in competing for entry into higher educational institutions.

Students in general secondary schools spend about one-fourth of their time on nonacademic subjects, including physical education, general technical subjects, training in production (both theoretical and practical), and productive labor. The proportion of time spent on subjects in this area immediately following the 1958 reform was much higher, but there were complaints that this diluted the quality of secondary education. In addition, factory and farm managers complained that the influx of unskilled young people into the production process disrupted rather than facilitated their schedules. Therefore, in 1964, the vocational training program in the general secondary

curriculum was cut back. However, the basic principles that all young people, regardless of social status, should be exposed to the production process and that those young people who do not go on to higher educational institutions should receive practical vocational experience were retained.

At the end of the 2-year course, students receive a Certificate of Maturity, which entitles them to apply for entry to an institute of higher education. Their vocational training does not commit them to take a particular job. The idea behind the combination of general and vocational education is that students emerge from their schooling fitted for industrial work and academic studies alike. As Soviet institutions of higher education have places for only about one-fourth of the pupils graduating from secondary school, this combination of academic and nonacademic training can often be a solid advantage.

(2) *Specialized secondary schools*—These middle schools resemble the general secondary schools in offering a combination of general and vocational training, but in the specialized schools the vocational element predominates, with more than twice as much class time as the general. These schools, sometimes known as *tekhnikums*, provide courses for students wishing to enter semiprofessional occupations, such as draftsmanship, clerical work, librarianship, bookkeeping, club organizing, and nursing. Between 300 and 400 occupations are catered for in this way. Some preschool and elementary school teachers still receive their training at schools of this kind, but the aim of the authorities is to phase out such programs in favor of training programs in higher educational institutions. The following tabulation outlines the growth in the number of specialized secondary schools and enrolled pupils since 1940:

	1940	1960	1965	1969
Number of schools	3,773	3,328	3,820	4,196
Number of pupils enrolled (thousands):				
Day	787	1,091	1,835	2,418
Night and correspondence	188	969	1,824	1,884
Total	975	2,060	3,659	4,302

Students can enter the specialized secondary schools directly from the 8-year schools, in which case they enroll in a 4-year course, or they can enter after completing the general secondary school, in which case they enroll in a 2-year course. The latter course places much greater emphasis on vocational training. As general secondary education becomes more widespread, it is the aim of the authorities to phase out the 4-year specialized secondary course and upgrade the 2-year course, tying it more closely with the higher educational institutions and feeding into them much the same way as American junior colleges feed into full-term colleges and universities. At present, students graduating from specialized secondary schools receive both a professional certificate and the Certificate of Maturity and are

eligible to apply for admission to higher educational institutions. The vocational bias of the school does not necessarily commit students to a job but serves to familiarize them with practical work, gives a professional qualification to those not proceeding to higher levels, provides an alternative for students failing to get into higher educational institutions, and furnishes a basis of practical experience for those who do. The majority, however, go straight into the appropriate jobs on completion of their courses.

(3) *Vocational-technical schools*—These schools, sometimes referred to as "trade schools" or by the old name of "labor reserve schools," are much more specialized than the two types of middle school described above. The main emphasis is on learning a particular trade. The following tabulation outlines the growth of the number of vocational-technical schools and enrolled persons since 1941:

	1941	1961	1966	1970
Number of schools	1,551	3,684	4,319	5,197
Number of persons enrolled (thousands)	602	1,064	1,599	2,252

About 15% of the persons enrolled attend at night.

Since 1964, vocational-technical schools have been divided into urban schools, which offer 1- to 3-year courses, and rural schools, which offer 1- to 2-year courses. Class time devoted to general subjects is limited to between 15% and 20% of the total, the remainder being spent on practical work in the shops or in the fields. The length of the courses depends on the trade involved (about 800 different occupations are dealt with), and students are paid at apprenticeship rates. Admission is open to graduates of the 8-year schools; those with more education are eligible to enroll in a shortened course. As with the specialized secondary school, the government intends to revise and upgrade the vocational-technical curriculum, once general secondary education becomes more widespread. At present the course culminates with the award of a trade diploma.

It is theoretically possible to go on from these schools to higher education, but to do so the student would have to fill out the rather meager amount of general education he has received. Some in fact do go on into higher education later, after studying in continuation courses in their spare time, but most students desiring higher education will select some other type of middle school.

d. HIGHER EDUCATION

(1) *Size and structure*—Of all the advances in the educational field in the U.S.S.R., few have provided more cause for pride on the part of both the government and the people than the spread of higher education in the universities and other institutions. In the early days of the Soviet regime the problem was to find enough trained graduates for the public need. Now the problem is to find some way of coping with the rising tide of would-be entrants for whom the higher educational institutions have no place; this was one of the considerations behind the 1958 reforms. The following tabulation outlines the growth of the number of higher

educational institutions, enrolled students, and persons graduated since 1940:

	1940	1960	1965	1969
Number of institutions	817	739	756	800
Number of students enrolled (thousands):				
Day	558	1,156	1,584	2,140
Night and correspondence ..	254	1,240	2,277	2,410
Total	812	2,396	3,861	4,550
Number of persons graduated (thousands):				
Day	98	229	225	296
Night and correspondence ..	28	114	179	269
Total	126	343	404	565

The large proportion of night and correspondence students is both financially and ideologically desirable. First, it enables the regime to avoid the expense of extra classrooms, laboratories, libraries, and dormitories, and secondly it helps combat academic exclusiveness by keeping as many students as possible close to the realities of working life. Even more important, the fact that part-time students stay at their jobs helps the national economy by insuring that the expansion of higher education does not mean too great a drain on a labor force seriously reduced by the losses of World War II.

Included in the student enrollment figures are approximately 16,000 foreigners studying in Soviet higher educational institutions. Half of these are in the capital, divided equally between Moscow State University and a school for the "preparation of specialists for Asia, Africa, Latin America, and the Arab East" called Lumumba Friendship University. This institution was founded in 1960 both as a propaganda gesture and as an effective means to isolate the foreign student from Soviet society and vice versa. The level of instruction there is more comparable to that in the upper years of the specialized secondary schools or the lower years of higher technical schools. The remaining 50% of the foreign students are distributed among the other major universities, such as those in Leningrad, Kiyev, Kazan', Khar'kov, and Odessa. Only in the United States, France, West Germany, and the United Kingdom is the foreign student enrollment greater than that in the U.S.S.R. The following tabulation outlines the number of foreign students enrolled in higher educational institutions in selected countries, the percentage these represented of the total student enrollment in each country, and the number of these countries' nationals studying in higher educational institutions abroad in 1966.

	FOREIGN STUDENTS ENROLLED IN HIGHER EDUCATIONAL INSTITUTIONS	PERCENT OF TOTAL ENROLLMENT	NATIONALS STUDYING IN HIGHER INSTITUTIONS ABROAD
United States	100,300	1.6	17,100
France	30,200	7.0	7,700
West Germany ..	26,300	6.5	10,200
United Kingdom ..	17,700	9.2	8,400
U.S.S.R.	15,800	0.4	500
Argentina	12,500	5.0	1,400
Lebanon	12,200	51.9	3,300
Japan	10,000	0.9	4,600

Soviet institutions of higher education, like the courses offered in them, are on the whole more specialized than their U.S. counterparts. In the European tradition, a clear division is normally drawn between, on the one hand, the humanities and pure sciences, which are taught at the universities, and, on the other, practical and applied studies, which are taught at institutes of other types. Many disciplines which in the West are usually dealt with in different faculties within a single university—such as law, medicine, and engineering—are more often than not studied in separate establishments in the U.S.S.R.

In theory, the universities and the other institutes of higher education in the U.S.S.R. reach the same standard and have the same status and esteem. In practice, perhaps inevitably, there are some inequalities, at least in terms of prestige, partly because of the broader curriculums of the universities and partly because of the traditional respect for the universities which dates from the prerevolutionary period. There is, however, no clear-cut official differentiation of status. All higher educational institutions (VUZy) have the power of conferring diplomas, conducting research, and awarding postgraduate degrees. The following tabulation presents a breakdown of the different types of higher educational institutions in 1966:

Universities	42
Polytechnical institutes	59
Specialized technical institutes	156
Agriculture and forestry institutes	106
Economics institutes	26
Law institutes	4
Performing and creative arts institutes	46
Medical institutes	82
Physical culture institutes	16
Pedagogical and related institutes	208
Total	745

The division between the various types of higher educational institutions is not hard and fast. Thus, in the 1930's most of the specialized institutes were formed by splitting off the relevant faculties from existing universities. This process was not thoroughgoing, however, and to the present day some universities still offer instruction in the applied sciences, engineering, agriculture, economics, business, law, medicine, physical culture, and library science. Furthermore, since the mid-1950's there has been a trend to create new universities, using pedagogical institutes as a base. Nevertheless, the combination of spinning off the professional and technical fields of study to specialized institutions and encouraging the enrollment of part-time students means that Soviet universities are relatively small by American standards. Together the universities account for only 10% of total student enrollment in higher education. The largest, Moscow State University, has a daytime enrollment of only approximately 15,000, comparable to the enrollment at American University or George Washington in the United States, while its total day, night, and

correspondence enrollment of 30,000 is only two-thirds the comparable figure at the University of Maryland.

The Moscow State University is the oldest Russian university, founded in 1755 (the University of Vil'nyus, founded in 1579, and L'vov, founded in 1661, arose under Jesuit auspices on territory then under the Polish crown), and the most prestigious. The university's main building, a massive Stalin baroque 32-story skyscraper on the Lenin Hills overlooking Moscow, contains the science faculties, lecture halls and laboratories, student housing, and a 5-million-volume library, and is an obligatory stop on Soviet tourist programs. The university's humanities faculties are housed in the original early 19th century buildings near the Kremlin. The university has some 4,000 foreign students and 3,000 graduate students, and a faculty of 4,500.

There were approximately 201,000 persons engaged in teaching in the higher educational institutions of the U.S.S.R. in 1965. The staffs of the various institutions usually include a relatively small number of professors, who in most cases hold a Doctor of Sciences degree; larger numbers of docents (equivalent to the American associate professor), mostly with Candidate of Sciences degrees (roughly equivalent to the Ph. D); instructors; and assistants. There are also a number of research specialists without teaching duties, and, where applicable, laboratory technicians, demonstrators, and other assistants. Appointments are made by the institution's academic council after advertising in the press; confirmation by the Ministry of Higher and Specialized Secondary Education is required for the posts of professor and docent. All academic staff members are appointed for a 5-year term, and in practice their appointments are usually renewed. The alternative of nonrenewal remains, however, in order to prevent staffs from atrophying through inactivity.

Each institution is divided into faculties, which are more narrowly defined than in the United States. Instead of faculties of arts or sciences, there are faculties of chemistry, biology, history, etc. Each faculty is headed by a dean, who is selected from among the faculty's professors by the rector and academic council of the institution. The dean's duties include the planning and coordination of teaching and research within the faculty, the organization of entrance examinations, and the selection, on the basis of final examination results, of students for graduate study. Faculties are subdivided into departments (literally "chairs"), which have several professors and are headed by a departmental chairman, usually a professor. Each department deals with a special field within its faculty.

The head of a higher educational institution is known as a rector, and he is assisted by prorectors, or deputy rectors. They are appointed and dismissed by the Ministry of Higher and Specialized Secondary Education, to which they are responsible for the efficient running of the institution. The chief organ for planning and administration is the academic council, which is chaired by the rector and is composed of the

prorectors, heads of faculties and departments, some of the professors, and representatives of the Communist Party, Komsomol, the educational trade union, and the ministry. Among its duties are the planning of teaching and research, the confirmation of the appointments of instructors and assistants, the nomination of docents and professors, and the awarding of higher degrees.

(2) *Courses of study*—Courses in institutions of higher education vary in length from 4 to 6 years, with part-time courses taking 1 to 2 years longer. Competition for entry is keen, sometimes fierce. All Soviet citizens under the age of 35 who have successfully completed a full secondary school course and obtained the Certificate of Maturity are eligible to apply for admission to the daytime program, but in practice the institutions have room for only a fraction of these. The proportion of applicants accepted varies from place to place, ranging from one in three to one in eight. In recent years the number of entrants has risen somewhat, but the number of applicants has skyrocketed. For this reason the practice of automatic admission of students solely on the basis of their overall secondary school record has been dropped, and entry is determined instead by the applicant's performance in competitive examinations and by the priorities established by *Gosplan* to meet future manpower needs in given fields. In addition, the social complexion of entering classes is expected to reflect exactly the ratio between applications for admissions from secondary school graduates and applications for admissions from production workers with 2 years of experience or military service. Other things being equal, preference is given to applicants who can produce references from party or Komsomol organizations, trade unions, or their factory managers. Applicants may apply to only one institution each year; those who fail to make the grade may reapply repeatedly.

In practice, the standards set for admission are flexibly interpreted to the benefit of former servicemen and former workers so that the desired social composition can be maintained. Standards tend to be lower in agricultural institutes than in polytechnical institutes, as they are in pedagogical institutes in comparison with the universities. Furthermore, it is easier to get into a university in the republican capitals of Alma-Ata or Dushanbe, for example, than in Moscow or Leningrad.

Once admitted, students in higher education receive all tuition free of charge. The only fees payable are dormitory charges of 1.50 rubles a month for those not living at home. Apart from the 10% to 20% of students whose parents' incomes are too high to qualify them for government aid, students who maintain satisfactory progress are awarded stipends. These can be forfeited if the quality of work falls off. Stipends vary a great deal in amount, depending on seniority, progress, and the student's field of study. Entering students are paid between 27 and 43 rubles a month, while senior students receive between 36 and 60 rubles a month, with those

achieving better grades receiving the higher awards in each category. There are also "personal stipends," commemorative scholarships paid in addition to the basic stipends and awarded only to really outstanding students. In 1970 3.5 million "stipendiates" were counted as relying on their scholarships as their principal means of support. Although the regime makes much of the system of student stipends, the average student's grant is insufficient for even the barest necessities. To meet expenses, students must rely on family assistance or part-time jobs.

Each academic year is divided into two semesters, the first running from the beginning of September to late January and the second from early February to the end of June, with vacations of 2 weeks in the winter and 2 months in the summer. Instruction, which can extend to as much as 6 hours a day, 6 days a week, consists of formal lectures, seminars, laboratory work, and practical studies, with a heavy burden of reading required during the rest of the time. As some weeks each year are set aside for such requirements as examinations and preparation of dissertations, formal instruction fills only about 30 weeks a year. Nevertheless, with a total of over 5,000 hours of teaching (plus time spent on extra electives) spread over the student's career, the student's time actually under instruction is roughly twice that of his Western counterpart. Since continued progress is a condition for the payment of stipends, and even for continued attendance, there is little room for the leisurely academic or the dilettante. All lectures and seminars are compulsory, though cutting of classes is not unknown. Prescribed reading lists in some departments are so lengthy that it is physically impossible for even the most conscientious student to get through them all. As the examinations draw near, there is much reliance on preparation for questions spotted in advance as most likely.

All students, whatever their special field, have to attend courses and pass examinations in Marxist-Leninist political theory. During the first 2 years there are classes in the history of the Communist Party of the Soviet Union (actually a survey of the history of the U.S.S.R. and 20th century world events from the approved political standpoint). Political economy and dialectical and historical materialism make their appearance in the third year, and include a fairly detailed study of Marxist philosophy and economic, political, esthetic, social, and historical theory. These political courses occupy a considerable part of the students' time. For those studying in the humanities, they amount to about 600 hours out of the total 5,000 hours of classtime; technologists and scientists, with the greater demands of practical work, have less, but even for them Marxist courses take up a total of 300 hours of lectures and exercises. This side of higher education is taken very seriously by the authorities, but according to reports in the Soviet press it is often taught mechanically and dogmatically, with the result that many students regard it as something to be learned for

the examinations and then forgotten once the graduation requirements have been fulfilled. In many institutions apathy is so widespread that it is common practice for students to carry on with their other work during the political lectures. Others reportedly sleep through the lectures. How openly they do this depends largely on the quality of the teaching. In spite of official demands for livelier political teaching, many of the tutors apparently believe that there is safety in dullness, since these are potentially thorny subjects.

Apart from political studies and a foreign language, a student's curriculum is confined throughout his course to his special study and a number of allied subjects. Training in mathematics and the natural sciences is of high quality and has produced skilled mathematicians, engineers, and other technicians with good academic qualifications, particularly in theoretical fields. Because of the high degree of specialization, however, technicians and professional persons are not so versatile as might be desired. Education in the social sciences and humanities falls far short of Western standards, largely because of the enforced conformity with party dogma and its use as a vehicle for political indoctrination. All curriculums are subject to approval by the republic or national Ministry of Higher and Specialized Secondary Education and are generally uniform throughout the U.S.S.R. for any particular subject.

Students are continually assessed throughout their courses. This is done by means of essays, laboratory work, homework, assignments, tests, and term examinations, usually a combination of written and oral. The final test is the Diploma thesis or, as it is known in the technical institutes, the Diploma project. This is a study of some particular aspect of the student's specialty in which he has to make use of the basic material of his subject and demonstrate his ability to use it for research and experiment. The student is allowed considerable time to prepare his Diploma work—the entire second term of the final year in most cases. He then presents the result at the end of the year and has to defend it in an oral examination before a board which includes professors of the institute and representatives of the higher education ministry. If the work is accepted, he is awarded his Diploma. The degree is sometimes given with distinction, depending not only on the quality of this one piece of work but also on the student's performance at the oral examination and his past academic record.

Graduates can be assigned for 2 or 3 years to any job in any part of the Soviet Union. At the end of this time they are free to seek employment wherever they wish. The main reason for this system is that there is no other way of adequately staffing schools, institutions, and industrial enterprises in the remote areas, especially since there still is a marked discrepancy between town and country in living standards and amenities. All traveling expenses to the new job are paid by the employer. Graduates who fail to report to their assigned

posts are, in theory at least, liable to legal penalties. Furthermore, as institutions are supposed to send the graduate's Diploma to his new employer, the delinquent employee forfeits his degree if he fails to appear. Certain categories of graduates are awarded a "Free Diploma," which releases them from assignments altogether. The regulations are complicated, but they exempt such people as active members of the armed forces or graduates with dependent relatives. Health considerations are also taken into account, and married couples are not separated. Otherwise, on the whole, first choice of the more attractive jobs is given to the better students. As a result, enterprises in the more remote areas tend to be staffed by the less outstanding graduates and often have to put up with a disconcertingly fast turnover of personnel. Soviet students are taught to regard their job assignments as a partial return for the benefits of higher education. Although graduates are thus assured of employment in their own field at the end of their course, even if not in the locality of their choice, the system has obvious disadvantages, and there is evidence that the authorities are very greatly concerned at the amount of evasion.

(3) *Higher degrees and research*—The range of degrees and certificates is more uniform in the U.S.S.R. than in the United States, partly because the system is centrally controlled and partly because there is no clear-cut distinction between degree-awarding institutions and others. All institutions demand only one qualification for their basic courses—the Diploma, with or without distinction. Two higher degrees can be taken, the Candidate of Sciences and Doctor of Sciences. Both require advanced study and original research and carry considerable financial advantages and social prestige for their possessors. In spite of their titles these degrees are not limited to the scientific field, just as our own Ph. D. is not limited to the study of philosophy.

Of the 800 higher educational institutions, approximately 550 offer graduate instruction and grant degrees. In addition, graduate programs and degrees are offered by some 750 "scientific institutions" attached to the Academies of Sciences of the U.S.S.R. and the constituent republics, the Academy of Arts of the U.S.S.R., the All-Union Academy of Agricultural Sciences, the Academy of Medical Sciences of the U.S.S.R., the Academy of Pedagogical Sciences of the U.S.S.R., and the Academy of Communal Economy of the R.S.F.S.R. Student enrollment is not large in any of these programs. Figure 84 outlines the growth of graduate student (*aspirant*) enrollment and persons graduated since 1940.

The degree of Candidate of Sciences, roughly equivalent to the American Ph. D., requires at least 3 years of study after the Diploma, in accordance with special programs adopted by the institution and approved by the higher education ministry, with an examination at the end. In addition the aspiring Candidate must conduct a piece of original research for

publication in his own field and defend it at a public hearing before an examining board appointed by the appropriate institution. Few graduates are admitted to higher degree work direct from their Diploma course; graduates usually have to work for 2 years or more before they can apply. Financial support for full-time graduate students is much more generous than for undergraduates, often amounting to as much as the salary they normally would receive if employed.

The degree of Doctor of Sciences is much more rarely awarded—the current ratio is one Doctor's degree for every 10 Candidate's degrees—and is regarded as an extremely high academic distinction. To qualify for this honor, a specialist must hold the Candidate's degree, have done several years of active work in his field, and have conducted and published major independent research, which he eventually has to defend before an academic council. All awards of higher degrees are subject to confirmation by the Higher Qualification Commission of the national Ministry of Higher and Specialized Secondary Education. This confirmation, particularly in the case of the Doctorate, is far from automatic. More demanding than the U.S. Ph. D., the Soviet Doctor of Sciences degree may have as its closest counterpart in the West the French *doctorat d'état*.

Until recently all members of the teaching staffs of institutions of higher education were required to spend an average of 3 hours a day in research. Such precision seems to have proved impracticable, and it is now stated that there may be more flexibility in the allocation of time between research and teaching. However, research is still regarded as supremely important and integral to the work of higher educational institutions.

Cooperation between higher educational establishments and industrial concerns is continually stressed, much of the most important research being conducted as a joint venture. Technical and scientific research is carefully planned throughout the country with the aim of dovetailing these organizations into one integrated scheme. In practice this often proves difficult to achieve, but the effort is maintained to keep educational work "close to life" and to fulfill the Marxist requirement of the "unity of theory and practice."

4. Teachers

Teacher training in the U.S.S.R., as in many European countries, is still based on separate institutions for different grade levels. On the whole, teachers of secondary school classes (grades 4 to 11) are given a full education at a university or pedagogic institute, while those for the elementary classes (grades 1 to 3) and for the preschool stages receive their training at specialized secondary schools. The whole structure of teacher training has been subject to continual reorganization since 1952, the trend being to reduce the number of different kinds of institutions. The eventual goal is to require that all schoolteachers have a full higher educational course. At the present time,

FIGURE 84. GRADUATE STUDENT ENROLLMENT AND PERSONS GRADUATED,
1940-69

25X1

	1940	1960	1965	1969
Number of students enrolled:				
Higher educational institutions:				
Day	11,506	13,463	33,344	36,472
Night and correspondence	1,663	6,943	20,068	20,538
Total	13,169	20,406	53,412	57,010
Number of students enrolled:				
"Scientific institutions:"				
Day	2,919	9,515	17,765	19,131
Night and correspondence	775	6,833	19,117	23,391
Total	3,694	16,348	36,882	42,522
Total students enrolled:				
Day	14,425	22,978	51,109	55,603
Night and correspondence	2,438	13,776	39,185	43,929
Total	16,863	36,754	90,294	99,532
Number of persons graduated:				
Higher educational institutions:				
Day	1,411	2,407	8,764	10,540
Night and correspondence	61	613	3,081	4,643
Total	1,472	3,020	11,845	15,183
Number of persons graduated:				
"Scientific institutions:"				
Day	454	1,718	4,701	5,864
Night and correspondence	52	779	2,694	4,763
Total	506	2,497	7,395	10,627
Total persons graduated:				
Day	1,865	4,125	13,465	16,404
Night and correspondence	113	1,392	5,775	9,406
Total	1,978	5,517	19,240	25,810

however, the distinction between primary and secondary training, though less sharp than formerly, still remains. Figure 85 outlines the educational qualifications of teachers in schools of general education, their experience, and the proportion of women among them in 1969.

The secondary pedagogical schools provide a 2-year course for graduates of the 10-year general secondary school. These schools typically have two faculties, one for primary and one for preschool education. In the Russian areas the overwhelming majority of students are women, but in areas such as Central Asia, with its Muslim tradition, the proportion of males is nearer 50%. The curriculum consists of instruction in the various primary school subjects and the usual education and psychology courses, a foreign language, and the prescribed political subjects. Teaching practice begins with observation in the first year and goes on to actual teaching in the second year. Despite efforts directed toward replacing these schools by the higher pedagogical institutes, their number has not markedly diminished. In 1966 there were 380 such schools with a combined enrollment of 264,000, and about 60,000 graduates.

The pedagogical institutes have been growing in number and importance since the mid-1950's. In 1966 there were 208 with an enrollment of 819,000 and almost 100,000 graduates. Entrance to the 4-year higher pedagogical program follows the general pattern for other higher educational institutions. The curriculum of the pedagogic institution can be divided into three main areas: political and general courses common to all students everywhere, educational theory, and courses in academic specialties. In contrast to the secondary pedagogical schools, in the pedagogical institutes the special subjects occupy the predominant part of the curriculum. Teaching practice begins in the first year with observation, and works up to continuous periods of teaching in an ordinary (as opposed to an institute-attached) school with only occasional supervision.

It is possible for a university graduate to go directly into teaching with only a minimal background in educational theory and practice. Officially, universities are supposed to direct into teaching more than half of their graduates annually. However, the universities' contribution to the teaching field is only one-tenth as great as that of the higher pedagogical institutes. The training given at the universities has the same general outline as at the pedagogic institutes, but there is much

FIGURE 85. TEACHERS: EDUCATIONAL QUALIFICATIONS, EXPERIENCE, AND PROPORTION WHO ARE WOMEN, 1969
(Percent)

	WITH HIGHER EDUCATION	WITH EQUIVALENT OF HIGHER PEDAGOGICAL EDUCATION	WITH SECONDARY PEDAGOGICAL EDUCATION	WITH OTHER SPECIALIZED SECONDARY AND GENERAL SECONDARY EDUCATION	WITHOUT COMPLETED SECONDARY EDUCATION	WITH LESS THAN 5 YEARS' EXPERIENCE	WITH MORE THAN 25 YEARS' EXPERIENCE	WOMEN
Principals of elementary schools.....	23.6	14.4	57.1	4.9	0.0	8.1	37.4	54
Principals of 8-year schools.....	84.4	13.9	1.9	0.4	0.0	5.9	31.6	27
Principals of secondary schools.....	97.9	2.0	0.1	0.0	0.0	2.7	37.5	23
Assistant principals of 8-year schools.....	80.0	14.7	4.5	0.8	0.0	9.8	19.6	59
Assistant principals of secondary schools....	91.8	5.5	2.2	0.5	0.0	8.0	20.1	61
Elementary school teachers.....	12.4	7.9	72.4	7.2	0.1	20.1	23.3	87
Secondary school teachers.....	72.9	17.3	6.0	3.8	0.0	21.9	14.5	75
Teachers of special subjects*.....	22.0	7.9	26.0	37.7	6.4	32.2	8.9	29
All educational personnel.....	49.4	12.3	29.2	8.3	0.8	20.9	17.9	71

*Music, singing, sketching, drawing, physical culture, and shop.

25X1

greater emphasis on academic specialties. On the average, the university graduate is about a year ahead of his institute-trained colleague as a subject specialist, but he is liable to be a less competent teacher and less well versed in educational theory.

Teachers can undertake advanced study and research in several ways. Institutes provide refresher courses and counseling centers for the "improvement of qualifications." These keep teachers up to date with the latest developments in subject matter and teaching methods. General courses normally are organized on the basis of 1 day a week, and teachers are released from their schools to attend. Teachers are expected to take such courses at least once every 5 years in the first 15 years of service. Pedagogic institutes, like other types of higher educational institutions, provide facilities for both full- and part-time graduate study and research. These programs follow the pattern described above in the previous chapter, Higher Degrees and Research.

The most prestigious center for research and study is the Academy of Pedagogical Sciences of the U.S.S.R. This body also acts as a general clearinghouse for educational studies and discussion and is the highest authority in the realm of educational theory and practice. The academy operates a large publishing house, issuing popular and scientific journals, theoretical works and textbooks, and specialized reference works. It also sponsors lectures, conducts academic competitions, and aids experimental schools.

All teachers in the U.S.S.R. belong to the educational trade union, known officially as the Trade Union of Workers in Education, Higher Schools, and Scientific Institutions, with a 1967 membership of more than 6 million. About one-fifth of these are members of the Communist Party, a marked contrast to the proportion of party membership in the population at large—about 6%—and yet another illustration of the close links between the educational system and the political aims of the regime. Membership in the union is "voluntary," but 98% join as soon as they start work, most of the remainder coming in not much later. The union's functions follow the pattern outlined above in the discussion of labor organizations. In conjunction with the ministries of education of the various republics, the union publishes profession-oriented newspapers in the respective languages, the largest being the Russian-language *Uchitel'skaya Gazeta* (The Teachers' Newspaper), which had a circulation of 1.1 million in 1968. This is in many ways one of the most valuable of its activities, for the papers not only publish news of interest to teachers but provide a platform for controversies and complaints, and are frequently instrumental in having grievances put right.

To judge by the number of complaints appearing in the columns of the educational press, teachers generally find themselves obliged to work well beyond the hours established for the different levels of schooling. Even though extra time is paid for at the appropriate overtime rate, teachers do not appreciate the

imposition. Demands on a teacher's time go beyond actual classwork. All are expected as a matter of policy to visit the homes of their pupils, to attend parent-teacher meetings, to take some part in extracurricular work, and so forth. Where the staff is adequate, these extras are not unduly burdensome, but when there is a shortage the extra duties as well as the teaching load can pile up alarmingly.

Teachers' salaries depend on a number of factors. Complete figures detailing salary scales in teaching are not available, which suggests that the authorities are not particularly proud of them. It is known, however, that higher educational qualifications, longer service, and location in certain remote areas tend to increase the salary received. Additional salary is also paid for extra teaching over the basic weekly maximum, the holding of higher degrees, the holding of administrative posts in conjunction with teaching, grading papers, setting up and maintaining laboratory equipment, supervising extracurricular activities, teaching in schools for the handicapped, and teaching a subject in a foreign language. Overall, a teacher's salary is somewhat below the wage earned by a skilled industrial worker.

This relatively low financial status is reflected in the teacher's social position. In prerevolutionary Russia, learning and scholarship were traditionally regarded with a reverence bordering on superstition, especially by those who lacked them. The teacher, as the intellectual with whom people were most likely to come in contact, was looked on with particular esteem, though tempered in some cases with suspicion. After the revolution the teacher's prestige diminished considerably. Socially, industrial work gained status at the expense of intellectual activity, and, politically, teachers as a group were suspected by the regime of being tainted with bourgeois influences. The influx of new, ill-trained teachers to the schools and institutes did not help matters. Since the 1930's the regime has attempted to restore the teachers' social prestige, but the propaganda, honors, and decorations have not been matched by comparable increases in the pay envelope. Even if individual teachers have not benefited materially and students regard teaching as only a second-best job, the Soviet people of late seem to have come around to valuing the profession in the abstract.

5. Youth organizations

The work of the school is so closely linked with the youth organizations that the latter can fairly be described as an integral part of the educational system. From one point of view they are political organizations and thus are part of the system insofar as its aims are the inculcation of Communist doctrine. Some of their functions are recreational, embracing the role played in Western countries by such bodies as the Boy and Girl Scouts, church groups, and youth clubs. They also play a prominent part in the normal work of the school in such matters as helping with discipline, moral education, the tutoring of backward pupils, the provision of spare-time

voluntary classes, and so forth. Significantly, the large amounts of money paid to the youth organizations by the state are included in the budget under normal educational expenditure. The youth movement is voluntary, includes both boys and girls, and is organized in three stages: the Octobrists, for children from 7 to 9; the Pioneers, for children from 10 to 15; and the Komsomol, for young people from 14 to 28.

a. **THE OCTOBRISTS**—Unlike the two senior branches, the Octobrists is not a formal organization but a rather vague preparatory stage for entry into the Pioneers. Any young pupil who behaves and does his work reasonably well can become a member, but there is no pressure to join, nor is the threat of expulsion used as a means of obtaining discipline. Teachers often use informal Octobrist groups to organize children for any task requiring cooperation, such as straightening up the classroom. As the members approach the age of 10, however, their teacher, together with Pioneers from higher classes, informs them about the Pioneer organization, its importance, and the duties and privileges of membership. He also acquaints them in advance with the Pioneer oath and rules that they will be expected to know.

b. **THE PIONEERS**—Reciting an oath to love the Soviet motherland and follow the precepts of Lenin and the Communist Party, the 10-year-old is admitted to the Pioneer organization and receives his triangular red scarf and badge bearing the motto "Always ready." Speeches made by the group leader and the ritual of the occasion impress on the child's mind the importance and responsibility of membership. At ceremonies of this kind held in schools, Pioneer Palaces, or factories throughout the U.S.S.R., the great majority of schoolchildren formally enter the organization which will have a more direct impact on their lives than any other while they are in school.

Although membership in the Pioneers is voluntary, most children do in fact join as soon as they are eligible. A few individualists stay out, but they are rare. Nonmembers are much more likely to have been suspended or even expelled from the organization for bad behavior of some kind. This near universality seems to result mainly from the natural gregariousness of children and from the fact that membership is treated as an honor from the time the child enters school. A further incentive is the range of interests and activities that membership offers the child.

Strictly speaking, it is not necessary to join the movement to take part in its recreational activities. It is not an exclusive body like the Communist Party but is described officially as a "mass" organization for children. Accordingly, nonmembers are not only allowed but encouraged to take part in its activities, in the expectation (nearly always justified) that they will become members.

The range of activities is almost unlimited. Education for leisure is taken seriously by the Soviet authorities and is provided for by an extensive network of school

clubs and out-of-school institutions in which the Pioneer movement plays a leading part. The movement provides or helps clubs and "circles" in the schools and elsewhere carry out a variety of hobbies, arts, and crafts. These range from small painting and singing groups in an ordinary school to full-scale youth orchestras and ballet and drama groups in the Pioneer Palaces. Exhibitions, festivals, and competitions are held frequently at the local, republic, and national levels. This compensates to a great extent for the rather meager treatment of the arts in the ordinary school curriculum. In addition to the emphasis placed on such traditional art forms as the dance, many of the organization's centers have theaters where children can produce and act in their own plays. There are also puppet and live theaters (142 in 1969) which present plays especially for children and young people.

In sports the position is much the same, even though more attention is paid to it within the school curriculum. Games taught in the schools can be pursued in clubs and at Pioneer centers, as can many additional sports, from soccer and hockey to tennis and fencing. There is the usual variety of festivals and competitions. There are also over a thousand children's sports schools to which pupils can go during their holidays or in their spare time for practice and instruction. In 1969, 8,512,300 children attended Pioneer holiday camps in the Caucasus, on the Black Sea coast, or similar places.

The youth organizations do a good deal to encourage interest in nature and provide opportunities for its study. The Pioneers organize festivals, meetings, and excursions of all kinds. There are naturalists' circles in many schools and Young Naturalists Stations (327 in 1969) in different parts of the country. Their main emphasis is on fostering interest in agriculture, but they also encourage nature conservation and have wildlife sections for activities such as birdwatching or entomology. Similarly, Children's Excursion-Tourist Stations (168 in 1969) combine sightseeing trips with the study of geographic and natural resources. Children's Technical Stations (553 in 1969) run clubs for the pursuit of all kinds of skills from radio engineering to modelmaking, and Children's Railroads (33 in 1969) afford entertainment as well as training in technical skills and organizational responsibility.

The most important of all the out-of-school institutions are the 3,781 Pioneer Palaces and Houses, where the children can go in their free time to follow their hobbies and interests. Some of these centers, especially in the more remote rural areas, are modest or even ramshackle, with limited space, scanty equipment, and a shortage of trained leaders. Others such as the center in Leningrad, which occupies the Anichkov Palace, are former residences of the old aristocracy converted to a new use. The showpiece of the system is the Pioneer Republic, a thoroughly modern and, by Soviet standards, sumptuous complex of buildings opened in Moscow in 1962 on the 40th anniversary of the founding of the Pioneer movement.

Recreational activities are not the only, or even the major, aim of the Pioneer organization. Its primary functions are educational—political, moral, and social. The Pioneer rules constitute a code of conduct calling for patriotism, loyalty to the party, willingness to learn, politeness, discipline, respect for work and public property, fortitude, honor, and good physical condition. The Pioneer organization is one of the principal means by which the educational system seeks to translate its aims into reality. Classroom opinion is mobilized mainly through the class Pioneer “detachment,” with expulsion from its ranks, a keenly felt disgrace, as one of its sanctions against offenders. “Socially useful” labor, regarded as so valuable in the inculcation of moral values, is organized by Pioneer groups. The responsibility of the individual member to be an example to other children is continually stressed, both in school and out. In short, from the maintenance of class order to the dissemination of social attitudes, from the organizing of school societies to the coaching of backward pupils, the Pioneer organization is a constant and extremely effective ally of the teachers.

The structure of the organization as well as its functions are closely bound up with the school. The basic unit is the “detachment,” one for each class, further subdivided into “links” or small informal groups. The school as a whole has its “brigade.” All the Pioneers of the school elect a Brigade Council, which coordinates most of its activities, guided by an adult Senior Pioneer Leader. The leader may be a professional specially trained for this kind of work, but, because these are in short supply, a member of the teaching staff frequently takes over. Pioneer work is an essential part of every teacher’s training course. Help is given by the Komsomols outside the school, by student teachers, and, in the case of schools with senior grades, by some of the older pupils.

As of 1967 the Pioneer organization had 23 million members and published 24 newspapers and 35 children’s magazines. The largest of these publications was *Pionerskaya Pravda* (Pioneer Truth), with a circulation in 1969 of 9,300,000.

C. THE KOMSOMOL—The All-Union Leninist Communist League of Youth, known as the VLKSM or Komsomol, is less directly linked with the school than its junior counterpart. It includes secondary school pupils, students in higher education, members of the armed forces, and workers in industry and agriculture. It is essentially an adult organization designed to link the top end of school life with the first years of normal work. Much of the membership is adolescent, yet the tone of the organization is studiously adult throughout. There are no symbolic ceremonies on entry, there is no trace of uniform (except for the Red Flag badge), and the stress in its activities is much more on political work and theory than in the Pioneers.

The Komsomol, like the Pioneers, is a “mass” organization, but the mass is smaller. Although it does not screen applicants as carefully as the Communist

Party, it is not as open-armed as the Pioneers with their almost universal membership. Komsomol membership in 1970 was estimated to be approximately 27 million, representing only about a third of all young people eligible to join the organization. In addition to the fact that prerequisites for admission keep some people out, individual choice holds down Komsomol rolls. Membership can sometimes involve arduous duties which many young people prefer not to assume. It can also involve loss of privacy; since members are expected to be an example to others and are liable to be taken to task by their comrades if their conduct is not exemplary. Furthermore, those young people who are alienated from or disinterested in the political process regard membership in the Komsomol as a great bore.

In structure the Komsomol is closely modeled on the Communist Party. The basic unit, as in the party, is the branch, situated in the members’ place of work or study. Branches can number from three to 100 members and are headed by branch secretaries. Branches are grouped geographically by district, districts by region or city, and so on to the republic level. Each level is administered by an executive committee, which elects a full-time bureau and secretary. At the highest level, a national congress elects a central committee to continue with the work of the organization between the meetings of the congress (the most recent congress, the 16th, convened in May 1970). Branch secretaries work part-time and are unpaid, but district secretaries and above are full-time professionals. The first secretary of the Komsomol is E. M. Tyazhel’nikov.

Instead of a formal set of rules as in the Pioneers, the Komsomol has a charter listing a large number of members’ rights and duties. Rights include those of election to the various organs of the Komsomol, a vote in such elections, criticism of all persons and organs of the Komsomol, and attendance when the individual is discussed by fellow members. Among the duties listed are the following: to improve one’s knowledge of technology, to help implement party policies and explain them to others, to develop criticism and self-criticism, to set a good example in labor discipline, to take care of public property, and to study Marxism-Leninism attentively.

The work of the Komsomol has been steadily broadened and diversified since its founding in 1918, and its influence extends into all fields of national life. The more strictly educational activities are channeled through its congress, its publishing house, and the Komsomol branches in schools and institutes of higher education. The national congress can serve as a forum for the discussion of general educational issues. It is possible that some of the suggestions arising from such discussions influence the final form of legislation proposed by the government, and it is likely that airing such legislation through the youth movement makes it easier to put into effect.

The Komsomol publishing house, *Molodaya Gvardiya* (Young Guard) produces a variety of books for

children and young people, prints the Pioneer publications, and publishes 108 newspapers and 17 magazines for its own audience. The largest of these, *Komsomol'skaya Pravda* (Komsomol Truth), had a circulation of 7.1 million in 1969. It should be kept in mind that the latter is not merely a youth newspaper. *Komsomol'skaya Pravda* is written for adult readers working in the economy, and on occasion it has played an important role in introducing new ideas in Soviet politics.

School branches of the Komsomol take a large part in the running of their schools. They elect committees to help with extracurricular clubs and societies; they run debates and meetings; they discuss problems of discipline, moral education, and scholastic progress with the principal, and they act as Pioneer leaders to help younger children with their part in the various tasks. They also make the teacher's job easier by keeping their own members in control, thereby setting a good example for their non-Komsomol classmates. Control is exercised by threatening expulsion from the organization. Inasmuch as the Komsomol is harder to get into than the Pioneers, membership carries more prestige, and expulsion accordingly is more of a disgrace.

In the universities and other institutions of higher education, the Komsomol plays an important role, too. Each faculty has at least one Komsomol branch. There is a committee for the whole institute, whose representatives sit on every administrative body in the school. So great is its influence that a good record of Komsomol work is considered along with the academic record when deciding which graduates will be given the best jobs.

As in the schools, the VUZ Komsomols organize socially useful work among the students, but on a more ambitious scale, such as assisting with the harvest on collective farms, working on building sites for community projects, helping at Pioneer camps during the holidays, and tutoring fellow students who have difficulty with their work. A monument to their efforts is the city of Komsomol'sk, on the Amur river in Siberia, founded in 1932 under Komsomol auspices. Student branches also concern themselves with the conduct of other students, using meetings, discussions, and wall newspapers to criticize the slackers and praise the conscientious.

One of the main attractions of Komsomol membership for some is the prospect of its leading eventually to membership in the Communist Party. For anyone who seeks to climb the ladder to influence, a good record of active work in the Pioneers and Komsomol is the best start he can have.

H. Artistic and cultural expression (U/OU)

1. The regime and culture

The arts, particularly literature and music, are very popular among Soviet citizens of virtually all social strata. This popularity reflects partly the persistence of a

traditional respect for culture and partly a desire to escape the drabness and regimentation of everyday life. The regime has encouraged interest in the arts and literature and fostered their development by maintaining numerous theaters, concert halls, museums, libraries, and special art schools; by issuing large, low-priced editions of literary works, prints, and phonograph records; and by rewarding "approved" creative and performing artists with material advantages as well as social prestige.

The interest of the party in intellectual and artistic affairs is motivated principally by considerations of propaganda and indoctrination. The party considers culture an essential tool in the building of a Communist society and the creating of the "new Soviet man." The party did not assume control of arts and letters immediately. During the 1920's the regime permitted considerable cultural diversity, and it was during this period that perhaps the greatest achievements of Soviet art took place. With the introduction of the First Five Year Plan (1928-32) and the assertion of strong party control over all aspects of society, however, creative artists were required to produce works which would promote the industrialization campaign. In 1932 the party further tightened its control when it abolished all existing organizations of writers, artists, and composers and called for the establishment of single unions in each of the arts. Shortly thereafter, "socialist realism," defined as the "truthful, historically concrete presentation of reality in its revolutionary development, which must be combined with the task of the ideological remaking and education of toilers in the spirit of socialism," was enthroned as the official, obligatory creative method for all branches of Soviet culture.

During the next two decades the quality of Soviet artistic work virtually collapsed in the face of insistent demands that they be solely propagandistic, praising above all the many qualities of the superhero, Stalin. Those refusing to go along were eliminated in the purges of the late 1930's. During World War II pressure on the arts eased, and the quality of creative production showed a distinct improvement. This proved to be but a brief interval, however, for in 1946-48 a series of decrees went out from the party reminding creative artists of their obligation to hew to the "socialist realist" line.

Within the general framework of "socialist realism," three qualities were to manifest themselves: *narodnost'*, *ideinost'*, and *partiynost'*. *Narodnost'* in the official definition implied an identity between the artist and the masses, and the artist's work was to be not only understandable but also capable of stirring the people to some positive action or attitude. *Ideinost'* implied that a work of art was to be a vehicle of ideas and not simply a creation for its own sake. *Partiynost'* meant that the artist should not only express the party line on all matters treated in his work but also show the party as the guiding force of all positive activity in the U.S.S.R.

With the death of Stalin, the regime slowly loosened its controls, allowing limited experimentation in art

forms, narrow access to developments in the arts outside the U.S.S.R. through participation in exchanges, international festivals, and congresses, and increased distribution of foreign works in the U.S.S.R. None of the essential controls in the hands of the party were loosened, however. The response of the intellectuals to this relaxation was positive, the more daring among them even venturing to question the well-established dogma of socialist realism. Most cultural leaders preferred, however, to temper their criticism, confining themselves to spotlighting bureaucratic rigidity and abuses.

Encouraged by Khrushchev's denunciation of the cult of personality—i.e., Stalinism—in 1956, writers and artists became more outspoken, daring to submit their books and articles for publication through the normal channels or organizing exhibitions and concerts of nonrepresentational works. The "thaw" was brief, however, and beginning in 1957 the Soviet intellectual community experienced a series of clampdowns and relaxations. The vacillating attitude of the regime encouraged debate, and the liberal and conservative camps soon equipped themselves with their own journals, cafes, theaters, poetry readings, summer colonies, and other vehicles of expression and assembly. By 1964 the liberal intellectuals, smarting after a sporadic campaign initiated by the party for greater ideological discipline in the arts, felt sufficiently confident to predict that intellectual life in the U.S.S.R. would soon adopt a more diverse tone, now that the conservatives had finally overreached themselves.

The fall of Khrushchev in 1964 swept intellectual debate under the rug momentarily, but disturbing signs soon became evident that the conservatives were, if anything, stronger as a result of the change. The starkest evidence of this was the arrest of A. Sinyavskiy and Yu. Daniel in late 1965 and their trial early in the following year. The regime charged them with sending "anti-Soviet" manuscripts abroad to be published, but actually it sought to demonstrate how it would henceforth deal with those intellectuals, usually younger and less prominent, who were discontented with the official artistic and literary policies.

The liberals, now on the defensive, refused to mute their protest, and, if anything, their desperation made them more daring. Individuals refused to sign denunciations of Sinyavskiy and Daniel circulated by the regime, distributing instead their own petitions and protests against the turn of events. Some of these were more broadly phrased as denunciations of creeping Stalinism, to which appeal many prominent intellectuals not involved in the earlier cultural debate freely lent their name. The regime refused to acknowledge these, however, and persisted in picking off the members of the liberal coterie one by one. Thus, A. Ginzburg and Yu. Galanskov, publishers of the underground magazine *Phoenix* 1966 and of an unofficial transcript of the Sinyavskiy-Daniel trial, were arrested in early 1967 and sent to a prison camp in the

far north a year later. A writer who demonstrated on their behalf, V. Bukovskiy, was arrested and jailed in 1967, and P. Litvinov, a mathematician who distributed the minutes of the Bukovskiy and Ginzburg-Galanskov trials and took part in numerous protests, including one against the Soviet invasion of Czechoslovakia, was arrested and exiled in 1968. Retired military man P. Grigorenko, who not only participated in the protests against the literary trials but was an active supporter of the cause of the dispersed Crimean Tatars, was arrested in 1969 and declared insane in two separate inquiries. In late 1970 the publicist A. Amal'rik, whose alienation from Soviet society was worn like a badge, was arrested and tried. At the same time such writers as A. Belinkov and A. Kuznetsov took the irrevocable step of defecting (in 1968 and 1969, respectively), as have a number of performing artists, including ballet dancers and choreographers, instrumentalists, and acrobats.

The more prominent liberals have been dealt with more discreetly. Thus, the poet Voznesenskiy found himself unable to travel abroad and his works barred from print or the stage for brief periods; Yevtushenko was eased off the liberal youth magazine editorial board in 1969, and on occasion has had to resort to patriotic verse to get into print; the controversial author Solzhenitsyn ceased to appear in print in 1966 and was ousted from the Writers Union in 1969; and the bastion of liberalism, Tvardovskiy, was eased off the editorial board of *Novyy Mir*, the principal liberal literary journal, in early 1970.

The motives for liberal discontent include feelings of moral obligation to speak up and defy evil, a deep concern for the future of the motherland, an elementary human reaction to abuse of moral standards by the men in power, and, looming over all, anxiety over the danger of being driven back to the intolerable days of Stalin's rule. All protesters seem united by a burning desire to secure for themselves and their fellow citizens conditions and guarantees of a decent and dignified life. In a democratic society the changes sought can hardly be regarded as revolutionary. In view of the peculiar character of the Soviet state, however, such changes would, if implemented, have a profound effect on the basic features and operations of the regime. Taking as the point of departure such traditional values of the Russian intelligentsia as truth, justice, honor, inner freedom, moral right, human dignity, courage, faith, and civic duty, the protesters press for redress of their grievances within the framework of the Soviet constitution and the existing institutional order, the validity of which they generally do not question. In most instances the signers limit themselves to raising such fundamental issues as the necessity of having effective machinery and political will to carry out the constitutional guarantees, observance of due process of law through open and speedy trials, impartial selection of witnesses, full public airing of court proceedings, scrupulous application of law, and public control of the courts. Protection of civil rights and, especially, the

right of dissent and the creation of honest and independent information media belong to the same category of demands.

Only an infinitesimal part of the Soviet population has even heard of these petitions and protests, not to mention having signed them. Yet the combination of a demand for simple justice and legality by the exponents of the intelligentsia is new and perhaps unsettling to the leaders of the regime, who have heretofore been free of the need to take the possibility of active political expression by this group into account. What is more important, perhaps, is that the present authorities have shown what can only be termed indecision in their dealings with this mood of disagreement among a small part of the intellectuals and the Soviet youth. The hesitation between the harsh application of Stalin-type measures and the *pro forma* observance of proper legality has served only to heighten the desire of many for the rule of law and has in some eyes created only the ironic situation of a vast and powerful government dithering in irresolution in the face of a relatively small and basically quite powerless body of poets, novelists, literary critics, and other intellectuals. This should not, however, be taken as implying that in individual cases the regime has not acted with severity. Still, there seems to have been no really consistent policy other than that of the reiteration of the repetitive and probably outworn adjurations to Soviet citizens to beware of the subversive Western ideological influences which have affected a "few immature seekers of sensation."

In order to implement its cultural policy the regime has developed an extensive control apparatus. Ultimately, cultural affairs are controlled by the party Politburo, which acts primarily through the Central Committee's propaganda departments and to a lesser extent through the Council of Ministers. Below the policymaking level an intricate network of agencies has been developed to screen the output of creative artists for conformity with official policy. On the governmental side the Committee for Cinematography has jurisdiction over motion picture studios and theaters, the Committee for the Press has jurisdiction over all aspects of printing and publishing and the book trade, and the Ministry of Culture concerns itself with the theater, illustrative art, sculpture, music, and a variety of cultural institutions. There are also "voluntary creative unions" of writers, composers, artists, architects, journalists, and motion picture workers which act as professional associations and protective societies and provide a control mechanism for the party. Figure 86 lists the principal "creative unions," their year of founding, and membership as of 1967.

In the view of the authorities, content is of overriding importance in any form of cultural expression. Moreover, the content must have political value. To be apolitical is in itself regarded as a political act of abstention. Content must be concerned with the external world and the common goal of the masses. Portrayal of the inner world of the individual is

FIGURE 86. PRINCIPAL "CREATIVE UNIONS"

NAME	FOUNDED	MEMBER-SHIP (1967)
Union of Writers.....	1932.....	6,608
Union of Composers.....	1932.....	1,566
Union of Artists.....	1932 (local level)..... 1957 (national level)...	11,600
Union of Architects.....	1932.....	11,047
Union of Journalists.....	1959.....	43,400
Union of Cinematographers.....	1965.....	4,145

regarded with suspicion as a distraction or an escape from the common goal. Stylistic or esthetic concerns are equally suspect. Ideologists resent any form of expression not immediately comprehensible to the masses, who must be inspired to work, not think, while censors fear that ambiguity may contain hidden meaning. The constant party pressure to infuse works of art with an ideological message has, with few exceptions, crippled creative initiative. As a result, Soviet citizens satisfy their craving for culture by turning to the classics, both Russian and foreign, in preference to the pedestrian Soviet product.

2. Literature

According to official interpretations, the contemporary literature of the people of the U.S.S.R. is the offspring of the 1917 revolution. In fact, however, the Soviet literary tradition is to a great extent an extension of the Russian literary experience, whose major period of world significance lies in the 19th century but whose origins can be traced back to the 11th century. For the first 600 years the overwhelming bulk of Russian literature was church related and church produced and written in Old Church Slavonic, an ecclesiastic language devised at the time of the Greeks' mission to the Slavs, drawing heavily on old Bulgarian and containing many Grecisms. Chronicles, lives of saints, tales, sermons, and letters were the principal forms of expression, many of them indebted to Byzantine models and subject to revision as they were copied and disseminated over time and space.

In the 17th century Polish and Latin influences began to make themselves felt on Russian literature, and a Russian secular language slowly began to take shape. The conscious effort made by Emperor Peter I to introduce Western culture to Russia in the early 18th century had a revolutionary effect on the language and subsequently the literature. A new, simplified secular alphabet was introduced; printing and publishing independent of the church was established; vast numbers of words of Western European origin were incorporated into the Russian language; and a heterogeneous, literate audience concerned with affairs of state, commerce, fashion, technology, and to a lesser extent the intellect, was rapidly assembled. Throughout the rest of the 18th century the Russian language and literature digested these changes. Russian poetry took

shape following the reforms introduced by M.V. Lomonosov and V.K. Tredyakovskiy; tragedy and comedy were developed by A.P. Sumarokov and D.I. Fonvizin; satire was launched by N.I. Novikov; and a modern prose style was created by N.M. Karamzin.

Building on all these accomplishments and launching a uniquely Russian literature was A.S. Pushkin. Poet, dramatist, and master of prose fiction, Pushkin is one of the great figures of world literature and is universally regarded by Russians as their most illustrious national genius. It is from Pushkin's career that Russians date the onset of their literary Golden Age (1820-80). Pushkin was followed by a chain of literary masters—M. Yu. Lermontov, N.V. Gogol', I.S. Turgenev, F.M. Dostoyevskiy, and L.N. Tolstoy, whose works are an integral part of the Western literary heritage and about whom libraries of critical literature have been written. The emerging Russian school of realism was profoundly influenced by the literary criticism of V.G. Belinskiy, N.G. Chernyshevskiy, and N.A. Dobrolyubov, all of whom were deeply influenced in turn by contemporary radical Western philosophy and social thought and were stout advocates of literature as a socially useful tool rather than as a work of art. Some observers believe that the eventual uncritical acceptance of the principles of these thinkers led to the end of the Golden Age. There is no question that these men, through their influence on such Russian Marxist ideologists as Plekhanov and Lenin, are the godparents of "socialist realism," the existing deadweight on Soviet cultural expression.

Even after the end of the Golden Age, new writers of international rank continued to appear. Among these were A.P. Chekhov, I.A. Bunin, and M. Gor'kiy, all skilled realist writers in the short story, novel, or drama forms. Their success, however, marked an end to the initial realist phase in Russian literary history. At the turn of the 20th century, partly under Western influence, a series of "modernist" movements, variously described as symbolism, acmeism, and futurism, burst on the literary scene. The advocates of these ideas stressed experiments in language, the perfection of form, and the creation of a new theory of esthetics. Their influence led to what is called the Silver Age of Russian poetry, during which such practitioners as A.A. Blok, A. Belyy, A.A. Akhmatova, and V.V. Mayakovskiy flourished.

The years of war, revolution, civil war, famine, emigration, and political harassment put a temporary stop to Russian literary life, but with the easing during the NEP period (1921-28), creativity briefly resumed. These years are frequently characterized as the richest of the Soviet period in terms of the quality and variety of the literary product. Soviet literary figures had many points of contact with the West and shared an experimental approach to the medium of literature. Mayakovskiy, by virtue of his identification with the Bolsheviks, dominated the scene, although his self-assumed task as a propagandist for the regime cut into his literary output. Coming to prominence in this period were K.A. Fedin, B.A. Pil'nyak, M.M. Zoshchenko, S.A.

Yesenin, L.M. Leonov, and M.A. Sholokhov. Many of the best literary talents of the period were neither Communists nor consciously proletarian, but being sympathetic to the revolution were dubbed "fellow travelers." Most of them were "modern" and favored experimentation, whereas the "proletarian" writers tended to be conservative and favored the traditional realism.

With the introduction of the First Five Year Plan, the regime began to narrow the diversity of literary expression, assigning the Russian Association of Proletarian Writers the task of policing the field. In 1932 all literary groups were dissolved, and in their place was substituted the Union of Writers, committed to the doctrine of "socialist realism." The works produced in the next two decades were not only tendentious, but simple, direct, and traditional in language and literary form. Many of the more brilliant writers whose political credentials were suspect perished in the purges of the late 1930's, and in 1946 party control was made even more rigorous after A.A. Zhdanov, a close associate of Stalin and party spokesman on cultural affairs, denounced such leading figures as Akhmatova and Zoshchenko.

Following Stalin's death in 1953 a "thaw" set in, during which a more critical tone was introduced into literary works, although traditional standards of language and form persisted. The regime reaction to this trend was marked by vacillation—relative tolerance, followed by reaction and reassertion of control. The movement for greater freedom of literary expression was embraced not only by such established writers as I.G. Erenburg (Ehrenburg) and B.L. Pasternak but also by new writers such as V.D. Dudintsev, A.D. Sinyavskiy (Abram Terts), and A.I. Solzhenitsyn and poets such as Ye. A. Yevtushenko and A.A. Voznesenskiy. The works of these and many other writers were received with great acclaim in the West, in some cases for other than artistic reasons. The resentment of the regime to these manifestations found expression ranging from refusal in 1958 to allow Pasternak to become the first Soviet—and second Russian—writer to accept the Nobel Prize for literature (the first Russian writer to receive the prize was Bunin in 1933, at the time an emigre) to expulsion from the Union of Writers for Solzhenitsyn and enforced residence in the provinces and deprivation of income for Yu. M. Daniel (Nikolay Arzhak), and of course bans on any publication of recent works.

If the author and his works were approved, however, nothing was too good for him. Thus, Sholokhov owns a large estate in the Don country and extensive property elsewhere, he is a member of the Supreme Soviet and the Academy of Sciences, and he went to Stockholm in 1965 with official blessings and fanfare to accept the third Nobel Prize for literature proffered to a Russian writer. The regime's negative reaction to the fourth award of this prize to a Russian—to A. I. Solzhenitsyn in 1970—bears out the difference in treatment of "approved" and "disapproved" authors.

An important role in the literary and cultural debate has been played by the so-called thick journals—*Zvezda* (Star), *Znamya* (Banner), *Novyy Mir* (New World), *Oktyabr* (October), *Yunost* (Youth), *Moskva* (Moscow), and others—as well as by the weekly newspaper sponsored by the Union of Writers, *Literaturnaya Gazeta* (Literary Newspaper—1969 circulation 600,000). Those who support the efforts of the regime to impose discipline on the literary scene, usually referred to as “conservatives,” tend to cluster around the journal *Oktyabr* (December 1970 circulation 140,000), while those who wish to erode regime controls, who are usually termed “liberals,” have rallied to *Novyy Mir* (December 1970 circulation 160,000). Erenburg, Dudintsev, Solzhenitsyn, and Sinyavskiy have all published in the latter journal. *Novyy Mir* played a leading role during the late 1950's and early 1960's in the literary rehabilitation of many writers purged in the 1930's. The journal *Yunost* (May 1970 circulation 1.8 million) shares many of *Novyy Mir*'s interests but is distinguished both by its emphasis on young writers and the problems of youth and its desire to experiment. Voznesenskiy's poetry has appeared in *Yunost*, as have the prose of V.P. Aksenov and A.V. Kuznetsov (the latter an “unperson” since his defection in 1969). Limitations appear to have been imposed on the “liberals,” however, as may be seen in the removal of A.T. Tvardovskiy from the editorship of *Novyy Mir* in early 1970.

The half-century span of the Soviet era has been marked by recurrent bloody periods of internal struggle. Many of the “liberal” intellectuals feel a deep need to come to terms emotionally with this past. Since to do so openly could bring into question the validity of basic party policies, some individuals have chosen to express themselves in Aesopian language, just as their literary ancestors did under the tsars. Carefully chosen selections from Russian history and literature as well as reports from abroad and science fiction have been used to comment obliquely on the Soviet period. Alongside this practice, however, a small but growing band of individuals does not resort to such diversions, and instead prefers to pit the strength of its open protest against the massive weight of regime oppression.

For all his vacillations, Khrushchev attempted to control and use intellectual ferment. His successors have been more concerned with smothering it, and recent landmark events in the Soviet cultural field have been trials, not publications. Instead of retreating to writing literature for the “drawer,” without knowledge of the authorities and with no intention of publishing it, or sublimating their creative impulse by translating foreign literature, as was the case in the Stalin era, the writers of today engage in the traditional Russian practice of *samizdat*, circulating their works in manuscript among sympathetic audiences. As the political content of the dissident movement has increased in recent years, so has the nature of *samizdat*. In addition to literature, it now contains civil rights

protests, political tracts and programs, appeals to foreign jurisdictions such as the Pope and United Nations Secretary General U Thant, and also increasingly sophisticated analyses of Soviet society and even “internal Kremlinology.” It is these *samizdat* “editions” which find their way to the West, where many of them are promoted with great fanfare as the latest in Soviet protest. Interestingly enough, the secret police have been known to peddle *samizdat* works, both real and faked, in an effort to discredit or intimidate dissidents.

3. Music and the dance

As with Soviet literature, Soviet music ostensibly is a child of the October Revolution, but in fact it is an integral part of the Russian musical tradition. There are two basic forms in Russian music whose influence persists, even though highly transformed, to the present day. The first of these is folk music, which took the form of songs intimately connected with natural forces and human emotions. The adoption of Christianity had little or no effect initially on Russian folk music, which continued to flourish, absorbing Oriental color from adjacent nomadic cultures. In addition to ritual songs connected with funerals, weddings, and changes of the season, there developed the *bylina* (epic ballad) and numerous comic, humorous, and satirical folksongs played and sung by jesters and buffoons. In later periods lyrical, satirical, and historical songs embodied in musical form occurrences of political or domestic importance. In the late 18th and 19th centuries many of these songs were collected and served as sources of inspiration for Russian nationalist composers such as M.A. Balakirev, N.A. Rimskiy-Korsakov, and P.I. Chaykovskiy (Tchaikovsky).

At the same time there grew up a rich tradition of church music based on the use of choirs in the Eastern Orthodox liturgy. Some of the longer masses, such as those at Easter, developed into a total feast for the senses when the congregants were enveloped in the sound of the choirs, the sight of the heavily jeweled icons, and the smell of incense. With this tradition of song, choral music, and spectacle, the Russians easily accepted the introduction of opera by Italian court performers in the mid-18th century and swiftly made the form their own. A series of Russian composers of opera, most of whose works were based on folk or historic themes, appeared in the last quarter of the 18th century, and their works were performed not only in the capital but throughout the country, wealthy landowners vying with one another to procure trained musicians. The influence of German romantic opera in the early 19th century brought about a general expansion of operatic forms and ideas, and in swift succession a series of major works were composed which remain standard items in the Soviet repertory but have only recently become familiar in the West. Among the better known composers in this field are M.I. Glinka, A.P. Borodin, M.P. Musorgskiy, Rimskiy-Korsakov, and Chaykovskiy.

Ballet was also introduced into Russia by Italian court performers in the mid-18th century, but this remained essentially an alien art form. Most of the choreographers and many of the dancers were first Italian and then French, and for the entire latter half of the 19th century Russian ballet was subject to the influence of the French choreographer and teacher Marius Petipa, who designed the "standard" versions of Chaykovskiy's ballets. The persistence in Russia of the French classical and Italian acrobatic styles long after they fell out of fashion elsewhere stamped the character of Russian ballet, and, despite a brief "national" period at the turn of the 20th century, these styles have been preserved to this day. The leader of the "national" school was S.P. Dyagilev (Diaghilev), who, after working as a promoter in the fields of typography, theater, painting, orchestral music, and opera, promoted the introduction of the Ballets Russes to the Western world. He drew on the stage scene painting of L.S. Bakst and A.N. Benua (Benois), the choreography of M.M. Fokin (Fokine), the dancing of V.F. Nizhinskiy (Nijinsky) and T.P. Karsavina, and the music of Borodin, Rimskiy-Korsakov, and I.F. Stravinskiy (Stravinsky). Following several successful seasons in Western Europe, the Ballets Russes became permanently resident outside Russia, and the company's notably successful transition from a nationalist to modernist ballet style after 1912 has had greater impact on the West than on Russia.

The symphony and other forms of orchestral music did not take shape in Russia until after the works of Berlioz, Schumann, and Liszt had become known. There had also been some experimentation by Glinka using folk themes, programs, and fantasy. These influences were fused by a group dubbed "The Mighty Handful," commonly called "The Five" in the West, which included Balakirev, Borodin, C.A. Kui, Musorgskiy, and Rimskiy-Korsakov. Their intention was to create Russian orchestral music free of German influence. Chaykovskiy and S.V. Rakhmaninov (Rachmaninoff) occupied a position in between "The Five" and the "Westerners," represented by A.G. and N.G. Rubinshtein (Rubinstein). By the early 20th century a modernist trend set in, the principal representatives of which were Stravinskiy, A.N. Skryabin, and S.S. Prokof'yev (Prokofiev).

As in literature, the revolution of 1917 led to the emigration of many leading figures, and after a brief period of modernist experimentation, the regime encouraged and then ordered a return to music which would be more "comprehensible" and less "divorced from life." Folk music and dance traditions were encouraged, and such groups as the Aleksandrov Red Banner Ensemble of Music and Dance of the Soviet Army, the Piatnitskiy State Russian Folk Choir, the Moiseyev Folk Dance Ensemble of the U.S.S.R., the *Berezka* (Little Birch) Folk Dance Ensemble, and the Andreyev Russian Folk Instrument Orchestra have been formed to cultivate these traditions.

Such traditional composers as N. Ya. Myaskovskiy, R.M. Gliere (Glière), and A.K. Glazunov put their talents

at the disposal of the regime, turning out numerous operas, ballets, concertos, symphonies, and other forms of orchestral music in the approved "socialist realist" style. Despite the clampdown on musical experimentation, notable work continued to be produced, especially by Prokof'yev, who returned to the U.S.S.R. after a decade in emigration, and such new composers as D.D. Shostakovich and A.I. Khachaturian. At the same time the regime made great efforts to expand the network of theaters, concert halls, and music schools, and there developed a Soviet generation of performing artists, including violinists D.F. Oistrakh, I.S. Bezrodnyy, and L.B. Kogan; pianists E.G. Gilels and S.T. Rikhter; cellist M.L. Rostropovich; and dancers G.S. Ulanova, O.V. Lepeshinskaya, M.M. Plisetskaya, and R.S. Struchkova.

Yet even such talented individuals as these in the creative and performing arts could not avoid the strictures of the regime in the late 1930's and again in the late 1940's, once the party decided that the arts needed closer supervision. Existing works were withdrawn or rewritten, and many composers and performing artists sought refuge in the most banal styles. During this period contact with developments in the West were broken off, and new forms and techniques were forbidden. Even after controls were relaxed following Stalin's death, dissonant and atonal music were frowned on, and most experimentation was discouraged. There have been extensive tours abroad by individual Soviet artists and composers as well as whole troupes, and Western critical reaction has been to praise the technique while passing over the contribution to art in as few words as possible.

For all the decline in quality, the regime has made every effort to get music to the masses and get the masses involved in music. Thus, in 1969 there were nearly 2,500,000 persons in more than 141,000 music, dance, or choral groups, numerous "people's" symphony orchestras, and several large-scale music festivals, mostly involving regional and national choral competitions. In addition there are 40 theaters of opera and ballet, including the famous Bolshoi in Moscow and Kirov (Mariinskiy) in Leningrad, 25 theaters of operetta and musical comedy, about 130 professional symphony orchestras, 19 conservatories, four institutes of the arts, 190 music schools, more than 3,000 children's music schools, 19 schools of ballet, and other institutions.

4. Art and architecture

In contrast to the worldwide renown accorded 19th century Russian and some Soviet accomplishments in literature and music, Russian and Soviet achievement in the fields of painting, sculpture, applied arts, and architecture have for the most part passed unrecognized. In part this is a reflection of Western indifference, but also it is because of the lack of any particular national genius in these areas. The latter may derive not only from the Orthodox iconoclastic tradition disapproving lifelike representations of the human form, but also from the lack of any deeply rooted secular tradition of good taste.

a. PAINTING—From the conversion of Kiyevan Russia in the 10th century until the reforms of Peter I in the 18th, Russian pictorial art served almost exclusively the interests of the Christian religion and the Orthodox church. Painters and craftsmen came to Kiyev together with Greek priests and monks bearing Byzantine icons. Russian craftsmen soon assimilated the Byzantine tradition and in the course of several generations achieved a high degree of mastery. Churches were lavishly decorated with frescoes according to the principles of Byzantine iconography, and gradually, during 200 years of imitation, a distinctly Russian style of icon painting developed which was two-dimensional, ornamental, and coloristic, in contrast to the three-dimensional, modeled, and subdued-tone Byzantine style. The Russian treatment tended to become graphic rather than pictorial. A reintroduction of the Byzantine style in the 15th century made itself felt in the work of A. Rublev, who is considered the master in the field of Russian icon painting. Other notable icon painters of the period were Dionisiy and the painters of the Stroganov school. By the mid-16th century, however, Russian icon painting had lost most of its vitality, largely because the church decreed that no further changes were to be made in the iconography and laid down precise rules on how icons were to be painted.

An influx of foreign (chiefly Italian) artists in the mid-18th century introduced the baroque and classical styles, and these were copied by Russian painters, many of whom were trained at the Academy of Fine Arts, founded in that period in Saint Petersburg. Portraiture and the art of interior decoration were the first to develop, since they were the best suited to the requirements of the court and nobility. The classical style of painting was subsequently introduced and persisted throughout the last third of the 18th and first third of the 19th centuries. It was followed by the romantic style in the middle third of the 19th century.

In 1863 an open rebellion against the academic style and standards took place in Saint Petersburg. A group of painters, inspired by Chernyshevskiy's insistence that art should not be a matter of form but should transmit a meaningful and realistic message, organized an artists' cooperative, subsequently named the Society for Traveling Art Exhibitions (*Peredvizhniki*). This group dominated Russian realistic art until the end of the 19th century. Among its more successful members were V.V. Vereshchagin, I.I. Levitan, and I.E. Repin. In reaction to the realist style, a group of impressionists began to form in Moscow at the end of the century, and shortly thereafter a group which formed in Saint Petersburg around the journal *Mir Iskusstva*, from which the group took its name, advocated the introduction of modern styles. This *Mir Iskusstva* group split into futurists, imaginists, suprematists, constructivists, and so on, and produced such well-known modern artists as V.V. Kandinskiy, M. Chagall, V.A. Tatlin, and K.S. Malevich.

The era of experimentation did not survive the 1917 revolution for long, and many of Russia's better known painters emigrated. By the end of the 1920's the official policy had been established that art belonged to the people and must therefore be understandable to them. "Socialist realism" in painting turned out to be a revival of the late 19th century realist school, but with a restricted choice of subjects. The Stalin period saw an all-time low in the esthetic style and quality of painting, with the production of many heroic portraits glorifying the leader, and the post-Stalin period has witnessed little improvement. Outside official art, however, younger painters have produced a whole crop of "closet" paintings, many of which are in the ideologically disapproved abstract and nonobjective styles. Although for the most part they have not been shown in public, their existence is known to sympathetic members of the Soviet elite as well as foreigners, and isolated examples have been purchased and received favorable publicity abroad. One of the largest collections of modernist (and therefore "underground") Soviet paintings is found at the Dubna nuclear physics center. The community of interest between experimenters in the arts and the sciences probably has come about not only because of their common recognition of the existence of concepts too complex to yield to conventional forms of expression but also because of the fact that the sciences, with their relatively less rigid regime controls, have attracted some of the most independent minds.

b. SCULPTURE—Sculpture as an art has on the whole been rather alien to Russia. The Orthodox Church explicitly forbade the embellishment of churches with three-dimensional images. Sculpture was introduced in Russia as a Western art form only in the early 18th century under the auspices of Peter I. The marbles imported during this period were mostly of second-rate quality, as were many of the foreign sculptors who agreed to come to Russia to work and to instruct. A series of Russian sculptors of only local significance worked in the late 18th and 19th centuries, fulfilling commissions for numerous monuments to rulers, generals, and other civic figures, as well as decorating the numerous classical-style buildings erected during this period. The painter M.A. Vrubel turned out some minor works at the end of the 19th century, apparently indebted to the style of the contemporary French genius Rodin, and the *Mir Iskusstva* movement did produce one outstanding sculptor, A. Archipenko, who was greatly influenced by cubism but who emigrated after 1917. Since the late 1920's the prevailing theme has been realism raised to an heroic scale, and the Soviet landscape is littered with innumerable grandiose statues and busts of Lenin and other party greats, as well as muscular workers and peasants done in the best high-fascist style.

c. FOLK AND APPLIED ART—In the 1920's an effort was made to preserve existing folk arts and establish an

industry incorporating both folk themes and advanced Western design. Thus, the lacquered miniature workshops of Fedoksino, Palekh, and Mstera were preserved, as were the Bogorodsk centers of carving, the metalworking ateliers of Dagestan, the leatherworking centers of the Caucasus and Central Asia, the art ceramic factories of Leningrad, and the art textile factories of Moscow and Ivanovo. Innovations in the design of furniture, apparel, interior furnishings, and textiles were introduced in the 1920's by Tatlin, A.M. Rodchenko, and V.F. Stepanova, under the influence of European modern design, but these failed to take root, and by the 1930's Soviet applied art was limited to superimposing folk motifs, inappropriate or not, on nearly every type of consumer product. Since the mid-1950's the regime has encouraged better design, particularly in interior furnishings. There has as a result been produced (mostly in the Baltic republics) a series of good, if not great, designs in limited editions of textiles, ceramics, and glass which seem to draw inspiration from the more conservative prewar Scandinavian trends.

d. ARCHITECTURE AND CITY PLANNING—Until quite recent times the principal building material in Russia was wood, and frequent fires destroyed most early examples of domestic architecture, the rest disappearing through decay. The oldest surviving buildings are the brick and stone churches which initially were built according to Byzantine models. In time, local variations such as the sloped roof (to shed snow) and onion-shaped dome were introduced; the latter so caught the public imagination that multidomed churches became the standard. Wooden churches were quite different in appearance, being basically towers with tall, tent-shaped roofs covered with small, lantern-like domes. The wooden church forms were translated into stone in the 15th century and served as one of the inspirations for the famous 16th century Cathedral of Saint Basil the Blessed in Moscow.

In the late 15th and 16th centuries Italian architects began to work in Moscow, bringing with them the late renaissance and baroque styles and blending these with traditional Russian styles. One outcome was the Kremlin fortress, many of whose features were subsequently copied in smaller versions elsewhere in Russia. With Peter I the baroque style was introduced in a strictly Western version. The Emperor expended all his efforts on his new capital, Saint Petersburg; which, with the continued impetus provided by his successors, the talents of a series of Italian and French architects, and a succession of baroque, rococo, and classical styles, became one of the most impressive and beautiful architectural ensembles in Europe.

The classic style proved particularly attractive to the nobility, and all sorts of buildings employing its motifs sprang up throughout Russia in the late 18th and 19th centuries. The leading architects of the late 18th century, V.I. Bazhenov, M.F. Kazakov, and I.E. Starov, can be considered the originators of a distinctly Russian

classic style, with its emphasis on simplified form and majestic scale. In the mid-19th century an increasing eclecticism became evident in architecture in Russia, as elsewhere in Europe, and this was followed by a romantic revival—parallel to the Gothic revival in the West—resulting in a none-too-successful pseudo-Russian style featuring onion domes and pointed arches. At the turn of the 20th century, some interesting “art nouveau” structures were erected, but at the same time Russia was plunged into the neoclassic revival sweeping Europe and the United States.

Following the revolution, Russian architects produced a series of structures in the international modernist style which they considered appropriate for a new society. Many of the more ambitious projects, embodying elaborate adaptations of the “architecture” of machinery, never were realized; nevertheless, until the 1930's Moscow was one of the foremost centers of experimentation in architecture. The rapid urbanization and industrialization of the country produced many monuments of modern architecture, including the town plan for Magnitogorsk, the rebuilt center of Khar'kov, and the *Izvestiya* and *Pravda* publishing houses in Moscow.

Modernist architecture went the way of all modern art tendencies in Russia in the 1930's, but there were no spectacular arrests, executions, or even rebukes, as there were in literature and music. Modernism gave way to a “socialist realist” style which was really a revived neoclassicism, at times either blended or merely decorated with native architectural motifs. Many of the facades built in the 1930's along the new *prospekts* (avenues) of Moscow were in the native-decorated, neoclassic style, and the Moscow Metro stations were perhaps the most thorough prewar application of this approved “socialist realist” style. After World War II the neoclassic style degenerated into what is sometimes called the Stalin baroque, or wedding cake style, the best examples of which are the skyscrapers built in Moscow housing the State University, Hotel Ukraine, and the Ministry of Foreign Trade.

During World War II the U.S.S.R. suffered extensive damage to its building stock, and for more than a decade afterward it devoted its energies to rebuilding apartment houses, factories, offices, and schools as quickly and extensively as possible. At the same time it lavished considerable care into restoring or rebuilding architectural monuments, many of them churches, damaged or destroyed in the conflict. Many of the utility rebuilding schemes were poorly executed, and following the death of Stalin the regime declared its intention to introduce a better quality of design and construction. Unfortunately this intention has remained a dead letter to a great extent. The decorative frenzy of the late Stalin period was dispensed with, but in its place was substituted prefabricated construction of no character whatsoever. Extensive residential districts consisting of thousands of acres of five-story apartment buildings sprang up around the major cities, most soon

displaying a pervasive shabbiness and shoddiness. In addition, many of these new districts had no provision for adequate public services or transport, leaving the residents to their own devices to make life livable. These lapses arise from the tendency of Soviet architects first to draw up very attractive, if sometimes academic and grandiose, city plans on paper without regard for the wishes of the inhabitants or the effects on the environment, and then to walk away from the project without checking on how the plans are realized. Even such a well-built and fairly well-designed individual building as the Palace of Congresses fails because the architects neglected to take into account the architectural heritage and historical milieu of the heart of Moscow. On the other hand there have been a few successes in the last decade, such as the Pioneer Republic in Moscow and the Bratsk Hydroelectric Station in Siberia. Unlike the other arts, a tame modern style is tolerated and even encouraged in architecture, and there are signs that the increasing use of painting and sculpture as part of the overall design, as well as more contemporary interior furnishings, may lead to the tolerance of a similar tame modernism in the other visual arts.

5. Minority cultures

Regime controls over style and content pervade the artistic and intellectual life of the entire U.S.S.R. Except for differences in local color, many contemporary Russian, Estonian, or Armenian writings are full of the same stereotypes and are practically indistinguishable from each other. Among the more important non-Russian ethnic groups, however, the memory of native cultural achievements and the survival of local folklore, traditions, and customs help to keep alive a sense of national consciousness and a desire for national recognition.

a. THE UKRAINE—The Ukraine is the cradle of Eastern Slavic culture, as it was in Kiyev that the Byzantine church, literature, music, art, and architecture were introduced and took root. In the 14th and 15th centuries the temporary seizure of the Ukraine by Poland led to the introduction of Western forms of art, but these did not reach beyond the "Westernized" nobility who assimilated into the Polish ruling class, while the peasantry clung stubbornly to Eastern Slavic traditions. Ukrainian folklore is colorful and abounds in fairytales, sayings, legends, ballads, and riddles. It was on this fund that Ukrainian writers drew after 19th century European romanticism produced a national awakening in the area and the Ukrainian idiom was elevated to the status of a literary language.

The leading Ukrainian poet of the 19th century, and still the chief symbol of the nationalist movement, was T.G. Shevchenko, who was also a locally distinguished painter. Writing poems much in the manner of Ukrainian folk songs, Shevchenko protested against national and social oppression and called for the casting off of Russian rule. The national seizure was restricted

to a relatively narrow section of educated society, however, and some Ukrainian writers, notably N.V. Gogol', preferred Russian as their literary medium.

By the beginning of the 20th century the Ukraine had produced a number of locally prominent poets, novelists, and dramatists, among them I. Ya. Franko and L. Ukrainka. A series of literary journals attracted leading talents and facilitated familiarity with trends in the West. After 1921, however, literature in the Soviet Ukraine was deprived of its best talents and made a tool of the regime. In the western Ukraine, occupied at the time by Poland, Ukrainian writers continued to struggle for the preservation and development of their national and cultural distinctiveness.

During the 1930's many leading Soviet Ukrainian writers, scholars, and scientists were silenced or liquidated. At the same time, those aspects of the native tradition that could profitably be used for propaganda purposes were preserved and cultivated. As elsewhere in the U.S.S.R., World War II brought a short period of relative relaxation in the arts, only to be followed by a resumption of rigid controls. The officially approved Ukrainian arts have shown little vitality or originality and have not attracted many new talents. Even so noted a Ukrainian writer as A.E. Korneychuk has preferred to write in Russian and figures prominently as a "Soviet" author.

In recent years, however, a reversal has been noted. For example, O. Honchar (Gonchar), head of the Ukrainian Writers Union and recipient of a Lenin Prize in 1964 for his faithful reproduction of the standard Soviet production novel, surprised the critics in 1968 with a novel idealizing the Ukrainian past and the Eastern Orthodox tradition and denigrating the quality of modern urban life, identified in Ukrainian eyes with the Russians. Even more outspoken have been the literary critics I. Dzyuba and V. Chornovil, who have frequently denounced Russification and literary conformity. For their efforts they have suffered arrest and repeated denunciations on the part of the conservative Ukrainian literary establishment.

b. BELORUSSIA—Belorussia has no outstanding artistic and intellectual tradition. The beginnings of the Belorussian written language can be traced to the 13th century, when it was used as the official language of the Lithuanian kingdom, which at that time included the Belorussian lands. Following the union of Poland and Lithuania in the 16th century, Belorussian lost its favored position, and the area was subjected to extensive Polonization.

Belorussian folklore never became a force for rallying national sentiments. Folk tales were usually concerned with specific events in specific localities and conveyed no sense of social or ethnic cohesion. Folksongs were full of social lament and a spirit of melancholy defeat, but they displayed no sense of defiance or national resistance. Primarily concerned with the general lot of man, Belorussian folklore has produced no concept of nation.

A vague nationalist movement began to emerge in Belorussia late in the 19th century, when a few native writers chose to use the Belorussian language as their literary medium. Centered around a thin layer of educated gentry, these literary activities met with practically no response from the masses. At the turn of the 20th century a new generation of writers, some of them representing the lower strata of the people, attempted to foster a national revival by creating myths about the Belorussian past. The works of Ya. Kupala and Ya. Kolas are considered classics by Belorussian literary historians.

During the 1920's and 1930's artistic and intellectual expression in western Belorussia, then under Polish rule, had to contend with censorship and repression and devoted itself to themes of civic lament and loyalty to the native land. In eastern Belorussia, under Soviet rule, the leadership of the national movement was eliminated and replaced by Communist-oriented personnel. Native literary, theatrical, and musical activities were encouraged, but given a new direction. Anything emphasizing the unique destiny of Belorussia was quickly stifled.

Belorussian literature and scholarship since World War II have been charged with finding elements in the national tradition which will draw it closer to both classic Russian literature and the "multinational literature of the U.S.S.R." The use of the Belorussian idiom in schools, radio, press, and in the literary productions of the area continue as part of official policy, but it is an artificial growth, increasingly subject to the pressures of Russification.

c. THE BALTIC PEOPLES—Estonia, Latvia, and Lithuania possess a modern literary and artistic tradition which has its roots in a common 19th century awakening. The spread of literacy and the impact of the European romantic movement on these countries gave impetus, as elsewhere, to a nationalist revival and clarified the desire of the Baltic peoples for self-expression. All three languages had taken written shape in the 16th century, and separate religious and secular literatures developed in the 17th and 18th centuries, respectively. In the 19th century an immense number of folk tales, songs, poems, legends, and epics suffused with nationalist sentiments were collected and published. Native customs, dances, and crafts (wood and metal carving, ceramics, weaving, and embroidery) enjoyed a popular revival. Each of the three Baltic peoples exhibited a particular love of lyric poetry and song. They had a strong penchant for group singing. Hundreds of town and country choirs assembled periodically to participate in national singing festivals, which became one of the principal expressions of national solidarity.

At the beginning of the 20th century there was a growth in native literature, music, and drama—arts which enjoyed the most popularity among the Baltic peoples. Heavy emphasis was placed on the national language and on the development of the national spirit.

During the period of their independence (1918-40), each of the countries produced, in addition to poets, novelists, dramatists, and musicians, numerous scholars and scientists. Although nationalism and local color continued as important themes in the arts, Western currents such as symbolism, expressionism, surrealism, and other modern schools had a profound influence in this period. In both quality and range, the Baltic literatures and arts far surpassed the merely provincial.

Under Soviet domination, literature, theater, music, and the fine arts in the Baltic republics have been placed, as elsewhere in the U.S.S.R., in the service of Soviet propaganda. These nations have produced no outstanding literary or artistic work since the Soviet occupation. As a form of passive resistance many native writers have turned to translation as their major occupation. At times some are upbraided in the local press for writing about personal concerns or impressions instead of contemporary social problems. After a period of withdrawal during the late 1940's and early 1950's, artists and architects have cautiously resumed working in the modern style prevalent in their countries in the 1930's. The success of their efforts has proved particularly attractive to the Soviet public, and the regime is encouraging the introduction of Baltic design into the interior of the U.S.S.R.

The regime has sought to harness the Baltic folk arts for the promotion of Soviet objectives. Periodic national art festivals, replete with folksongs and dances, are staged to emphasize such themes as the brotherhood of the Soviet nations. By manipulating national forms and symbols, the regime seeks to transform local loyalty into loyalty to the larger Soviet society. While much in the content of native cultural life in the Baltic region has been emasculated, the native folklore and song that have been preserved in the memory of the people continue to provide a focus for national feelings which the regime has been unable to eradicate.

d. THE CHRISTIAN CAUCASIAN PEOPLES—Georgia and Armenia have a cultural history stretching back to the 2d millenium B.C. Not only do gold, silver, and bronze ornaments from the period survive, but there are also contemporary examples of small sculpture, ceramics, metal, wood, and stone carving, painting, and scattered ruins of forts and temples displaying a conscious architectural style. Furthermore, the oldest literary epic in the area, preserved as oral literature, dates back to the 2d millenium, and there is reason to believe that much of the folk music predates the introduction of Christianity in the 4th century A.D.

The conversion of the Georgians and Armenians caused a profound redirection in their culture. For the next 600 years all the energies of these nations were devoted to building numerous churches and cathedrals in a unique style, decorating them with sculpture and painting, composing a rich body of church music, and, following the introduction of distinctive national alphabets, writing vast amounts of religious literature.

In the 10th and 11th centuries, however, the religious impulse declined, and the Georgians and Armenians instead concentrated on writing various forms of secular poetry, songs, tales, legends, and epics, creating highly sophisticated portrait sculpture, miniatures, jewelry, stamped metal, and embroidery, and constructing numerous palaces, private houses, bridges, and forts.

A decline set in during the 15th century, following the conquest of the area by Turkey and Persia. Although worthy examples of the old style in Georgian and Armenian art continued to appear from time to time, the native peoples were ripe for the introduction and adaptation of Russian cultural styles when in the early 19th century most of the area was brought into the Russian Empire. The Georgians in particular tended to follow the Russian pattern of development, ultimately going through realist, symbolist, and futurist periods in succession. The Armenians, on the other hand, maintained ties with their fellow nationals in the Near East and Western Europe and thus were able to sustain a more distinct cultural image.

After a brief interval of independence between 1918 and 1921, the Caucasian republics fell under the control of the highly centralized Soviet regime, which soon compelled the adoption of the "socialist realist" style, varied only to allow fragments of local color. Many of the oral tales and epics were transcribed and translated into Russian, creating a stream of imitations in the antique manner. The readiness of Caucasian writers to resort to historical novels and tales in preference to descriptions of socialist reality has become a frequent point of criticism by the regime.

The authorities have encouraged the development of Russian and European art forms in the Caucasus—theater, opera, ballet, symphonic music, and cinema. Painting, sculpture, and architecture are also given generous support, but they have developed along typically Soviet lines. As a result, the contemporary artistic life of the Caucasian peoples is losing much of its indigenous national character, and prominent Caucasian writers, artists, and composers (e.g., Khachaturian) have achieved recognition as Soviet rather than as strictly national artists.

e. THE MUSLIM PEOPLES—The peoples of Azerbaijan and Central Asia, like those of the Caucasus, have an ancient heritage. Architectural monuments still standing date back to the 2d and 3d millennia B.C., and some of the present cities, such as Samarkand and Mary, have been in existence since the 1st millennium B.C. The area experienced a great artistic and intellectual flowering following the introduction of Islam in the 7th and 8th centuries which was parallel to the Persian and Arabic cultural developments occurring immediately to the south.

The area was subsequently swept by several waves of conquerors (Turkish, Chinese, Mongol), whose deeds were the raw material from which numerous tribal epics were created. The Turkic complexion of the region was finally established between the 10th and 12th centuries

A.D. Persian remained the language of culture for a protracted period, however, being used to produce notable religious literature in the 11th century, poetry in the 12th century, secular literature in the 14th century, and a Golden Age of Turkestan literature from the mid-15th to mid-16th centuries. Beginning with the 16th century, the Turkic peoples switched to using the Turkic "Chugatai" dialect as their classic literary language, although Persian remained in use among the Tadzhik peoples.

As with literature, the art and architecture of the region were heavily influenced by Persia and the Arab world. Numerous fortresses, mausoleums, and palaces were built from the 6th to the 10th centuries in adobe and clay. Between the 11th and 13th centuries brick replaced these materials, spurring a new wave of construction. Numerous mosques, mausoleums, theological seminaries, fortresses, and palaces date from this period. Architecture then experienced a series of declines and peaks, the more notable periods of renewed vitality occurring between the 15th and 17th centuries and in the late 18th and early 19th centuries. Further development was cut off by the Russian conquest. In the other creative arts a high level of accomplishment was achieved in stone carving, mosaics, metal ornamentation, ceramics, and rug weaving, all of which date from the 11th to the 13th centuries, and in the Persian style of miniatures and decorative painting introduced shortly thereafter.

Once Russian rule was established in Muslim areas, a process beginning in the 16th century and continuing into the 20th, Muslim culture tended to stagnate. Only at the end of the 19th century did there appear some Turkic imitations of Russian novels and plays, as well as some secular Turkic poetry. These did not find an audience, however, because most of the native population was illiterate. Following the revolution, the Soviet regime made great efforts to increase educational opportunity and at the same time transcribed the existing mass of oral lore. As much of this literature was in the form of heroic epic poetry, serving as a repository of patriotic sentiment as well as of group loyalties, the Soviet regime can be considered the foster parent of modern nationalism in the area. As a secular national spirit has developed, however, the regime has attempted to soften or expunge passages which could be interpreted as anti-Soviet or anti-Russian, and at the same time has encouraged the creation of new epic poems incorporating approved "socialist realist" themes. The regime also is encouraging the substitution of the Soviet-style novel for native poetry.

As in literature, most of the traditional visual art forms of the Muslim peoples have been refashioned in the past half century to fit Soviet patterns and Russian tastes. Native inspiration is used only for embellishment. In architecture local variation is allowed in ornamental design, in woodwork, mosaic, or brick tile. The ballet and opera—Russian art forms imposed on the native peoples—conform to the standard Soviet

style, ornamented with local motifs in song and dance. Even with the best efforts of the regime to create a Soviet culture in the region, however, local traditions persist and play a lively role in arousing sentiments of group loyalty and pride in the local cultural tradition.

I. Public information

1. The media, the regime, and the public

The Soviet regime has developed one of the largest and most complex systems of public communication in the world, and the Communist Party has forged a parallel system of control which is more elaborate and thorough than any other in existence. Both the system of communication and the control apparatus are oriented toward a single goal: They must serve as instruments through which the party and government mobilize the mind and will of the population. Mass communication in the Soviet Union is not based on the pursuit of profit. It does not aim to provide either a vehicle for the expression of individual opinion or an instrument for the amusement of its audience. These are defined as "private" goals, unacceptable as a basis for public communication. The media of communication must serve "social" goals set by the party and the state, but the specific definition of a social end is determined on an extraordinarily narrow basis.

The ends to which mass communication must be put are justified in terms of Marxist-Leninist theory, and that theory is interpreted by the Communist Party as meaning that the media are to be used primarily to strengthen the party in its self-assigned role as leader, teacher, and guide of the people. There are other goals, it is true. For example, the Soviet media give a relatively large amount of space to educational and cultural material, but even these "nonpolitical" activities are far from truly being ends in themselves. They are justified to the extent to which they facilitate the prime task of ideological indoctrination and more effective party rule.

Although the freedoms of speech and press are guaranteed by the Soviet constitution, they may be exercised only to the extent they "strengthen the socialist system," and the sole arbiter of this is the Communist Party. The right to issue information via any public and legal medium is accorded only to the party, the government, and public organizations ultimately controlled by the party, such as trade unions, cooperatives, and scientific societies. No individual or unofficial group has any legal means of presenting information to the public.

All media are closely controlled and guided by the appropriate national, regional, or local level of party organization. Personnel employed in the communications field are carefully selected, trained, and supervised by the party. Key positions on editorial boards and in other offices of authority are filled only by party members or by persons considered reliable by the regime. Important professional people, such as editors,

publishers, writers, and producers, are well rewarded by the regime in terms of salary, prestige, and privileges, but their function is strictly circumscribed by the imperative that they communicate only the party line. They have no voice by virtue of their position alone in setting the line.

The propaganda line used by the Soviet media ^{25X1} is formulated in the party Politburo, subsequently translated into directives drawn up by the responsible departments of the Central Committee, and put into practice by the governmental bodies associated with the various media at all administrative levels. Committees for radio, television, cinematography, and the press, which are attached to the Council of Ministers; the Ministry of Culture; and the Ministry of Communications carefully control the substance and form of media activity. The committees and the Ministry of Culture deal mainly with ideological matters and organization, while the Ministry of Communications handles mainly the technical aspects of the media.

All public information is closely censored in advance. The Main Administration for Safeguarding State Secrets (colloquially called *Glavlit*), attached to the Council of Ministers of the U.S.S.R., is the chief governmental censorship body. *Glavlit* makes certain that all publications, manuscripts, radio and TV broadcasts, still and motion pictures, lectures, and exhibits intended for the public are generally in keeping with the party line and do not disclose any economic or military secrets. Representatives of this body are attached to all publishing houses, printing plants, radio and TV stations, telegraph agencies, customs houses, and central post offices in all districts throughout the U.S.S.R. and also work closely with the Committee for State Security (KGB).

The government does not release statistics as to its subsidization of the various communication media, but the fees charged for TV and radio licenses, movie and theater admissions, and newspapers, periodicals, and books are not sufficient to cover expenses. The regime has paid increasing attention to cutting the deficit by such means as raising theater ticket prices, cutting down the number of free publications, merging or closing newspapers, and reducing overhead administrative expenses of the information agencies. Propaganda effectiveness, not economy, nonetheless remains the primary goal.

In general the public has adopted a cautious and skeptical attitude toward official information. The people are aware of the numerous shifts in the party line and realize that false, contradictory, and misleading information is disseminated, while other information is suppressed. The public is especially skeptical about the media's interpretation of the internal scene, as contradictions to it are frequently visible to the average citizen. The regime has had more, though by no means complete, success in communicating its version of external events to the public, largely because of the paucity of competing foreign sources of information.

Only a few foreign sources of information, mostly from Communist countries, are available to the Soviet public. A handful of American and West European newspapers and journals are sold at major foreign tourist hotels in Moscow and Leningrad, and some of these find their way into the hands of Soviet citizens, as do occasional copies of publications brought in directly by foreign tourists. Western books and periodicals are available for use by trustworthy members of the intelligentsia. The United States is permitted to distribute the USIS-published magazine *Amerika* in the U.S.S.R., under the terms of a reciprocal agreement which allows the latter country in turn to distribute the magazine *Soviet Life* in the United States. The number of copies of each issue was limited to 52,000 in 1968, but deliberate Soviet mishandling of distribution reduces the number actually sold to well below that figure. Foreign radiobroadcasts are sporadically jammed, but those programs which do get through—reinforced to a very small extent by increased tourism and occasional cultural exchanges—afford the population, particularly in the major metropolitan areas of Moscow, Leningrad, and Kiyev, supplementary means with which to judge the outside world.

2. Press, periodicals, and news agencies

a. THE PRESS AND PERIODICALS—The earliest periodical in what is now the Soviet Union appeared in 1621 under the title *Kuranty* (Chimes), a handwritten document circulated for the benefit of the tsar and his court. The first Russian newspaper, *Russkiye Vedomosti* (Russian Gazette), appeared in 1703 under the auspices of Peter I, and privately sponsored newspapers and magazines came into being in the mid-18th century. Gradually over the next 150 years the Russian Empire developed a varied and, for the time, lively press. It experienced its ups and downs with censorship, but for the most part it disseminated its various messages. Even the Marxists were able to get their ideas across, first by smuggling tracts and journals into the empire from the West in the 1880's and 1890's, then publishing illegally within Russia in the 1890's and early 1900's, and publishing legally after the 1905 revolution.

Lenin was the editor of the first Marxist newspaper, *Iskra* (Spark), printed in various Western European

cities after 1900, but after the split between the Bolsheviks and Mensheviks in 1903 he founded his own organ, *Vpered* (Forward). The revolutionary events of 1905 and fluctuations caused both by intraparty feuds and by changing governmental press policies led to a swift and confusing succession of Marxist newspapers, many published within Russia. In 1912, Lenin fostered the establishment of *Pravda* (Truth) as the chief editorial voice of the Bolsheviks. The paper first appeared under the editorship of Stalin, and then under Molotov. Although the regime made several attempts to close *Pravda* down, the paper persisted, using a variety of different names, until 1914, when the outbreak of war gave the tsarist regime a perfect excuse to clamp down.

Pravda resumed publication in early 1917 after the February ("bourgeois democratic") revolution, this time initially under the editorship of Molotov and then of Stalin. The Bolshevik press flourished throughout Russia during the 8 months of democratic rule, assuming many of the characteristics of style, content, and makeup which have persisted to this day. Following the October Revolution the Bolsheviks closed down the press of the other political parties and turned the assets over to their own publishing houses. Out of the confiscated media facilities a hierarchical press system was organized, with a small nucleus of party organs, such as *Pravda*, at the top, followed by government newspapers such as *Izvestiya*, and the "workers' journals," such as *Trud* (Labor), at the bottom.

As a pivotal party weapon the press was expected to grow rapidly in numbers and circulation. Theoretically the public communication channels were considered an integral segment of the whole society, intimately linked with the arts, literature, and music and closely synchronized with the economy and all other institutions and systems of the Soviet state. Indeed, in terms of actual growth, Soviet printing and publishing has indeed had remarkable success. Figure 87 outlines the development of the field from 1913 to 1969.

The number of books, periodicals, and newspapers issued by some 233 publishing houses is relatively large because of the multilingual character of the Soviet population. As of 1969, books and brochures were published in 61 languages of the U.S.S.R. and 40 foreign

FIGURE 87. PRODUCTION OF BOOKS, PERIODICALS, AND NEWSPAPERS, 1913-69

	1913	1940	1960	1969
Books and pamphlets:				
Number of titles (<i>thousands</i>)	30.1	45.8	76.1	74.6
Total editions (<i>millions</i>)	99.2	462.2	1,239.6	1,315.7
Magazines and other periodicals:				
Number of titles	1,472	1,822	3,761	5,553
Total annual circulation (<i>millions</i>)	116.5	245.4	778.6	2,569.8
Newspapers:				
Number of titles	1,055	8,806	*6,804	*7,514
Total annual circulation (<i>millions</i>)	na	*7,528.1	*14,977.1	*29,426.7

na Data not available.

*Does not include collective farm papers which appear less than once a week.

25X1

languages, periodicals in 46 languages of the U.S.S.R. and 22 foreign languages, and newspapers in 57 languages of the U.S.S.R. and nine foreign languages. Of the publications in foreign languages, those appearing in German, Polish, Hungarian, Finnish, Greek, Romanian, Bulgarian, and Korean, to name the major examples, can be and frequently are also directed to the large groups of their native speakers resident within the Soviet Union. The Russian speakers are greatly "overrepresented" when one compares their share of the total population (58.7% in 1970) with the number of printed items appearing in 1969 in Russian (78.6% of the books and brochures, 83.9% of the periodicals, and 75.9% of the newspapers). Of the other Soviet nationalities, only the Estonians, Latvians, and Lithuanians are also "overrepresented"—a testimony to their ability to maintain a higher cultural level and resist Russification pressures. Figure 88 provides a comparison between the linguistic breakdown of the population in 1959 and of the publishing output in 1969.

For all the proliferation of titles through multilingual versions, the Russian publishing industry is highly concentrated. Thus, of the 7,514 newspapers published

in 1969, only 628 fit the UNESCO definition of a daily—i.e., published four or more times weekly. The following tabulation compares the number of copies of such daily newspapers available per 1,000 population in selected countries for the 1966-68 period:

Japan	(1968) 492	U.S.S.R.	(1968) 305
United Kingdom	(1967) 477	France	(1967) 251
East Germany	(1968) 445	Poland	(1968) 199
West Germany	(1968) 328	Italy	(1966) 112
United States	(1967) 309	Yugoslavia	(1968) 83

Of the 628 daily newspapers, 183 were published six or more times weekly in 1969, and of the latter, 10 are officially defined as national in coverage. Figure 89 details the national newspapers of the Soviet Union.

Pravda is the most important newspaper in the U.S.S.R. and the only one to appear 7 days a week; the other dailies omit one day, usually Monday. Except for 30 separate evening newspapers issued in major cities (e.g., Moscow, Leningrad, Kiev), and an early edition of *Izvestiya* which appears in Moscow the evening preceding the date of publication, Soviet newspapers issue only morning editions. Most newspapers are 4 to 6 pages in length and cost 2 or 3 kopecks.

FIGURE 88. RELATIVE USE OF LANGUAGES AMONG TOTAL POPULATION AND IN PUBLISHING OUTPUT

LANGUAGE	PERCENT OF TOTAL POPULATION, 1959	PERCENT OF TOTAL EDITIONS, BOOKS, AND PAMPHLETS, 1969	PERCENT OF TOTAL SINGLE-ISSUE PERIODICAL CIRCULATION, 1969	PERCENT OF TOTAL SINGLE-ISSUE NEWSPAPER CIRCULATION, 1969
Russian	59.4	78.6	83.9	75.9
Ukrainian	15.9	7.3	5.1	9.6
Belorussian	3.3	0.7	0.6	1.1
Uzbek	2.9	1.9	2.0	1.9
Tatar*	2.4	0.2	0.4	0.5
Kazakh	1.7	0.9	0.9	1.0
Azerbaidzhani	1.4	0.6	0.7	1.2
Georgian	1.3	1.0	0.7	1.8
Armenian	1.2	0.6	0.4	0.8
Lithuanian	1.1	0.9	1.2	1.4
Moldavian**	1.1	0.4	0.5	0.8
Tadzhik	0.7	0.3	0.2	0.4
Latvian	0.6	0.9	0.9	0.7
Chuvash	0.6	0.1	0.1	0.2
German	0.6	1.1	0.1	0.1
Mordvin***	0.5	****	****	****
Turkmen	0.5	0.2	0.2	0.4
Kirgiz	0.5	0.3	0.4	0.4
Estonian	0.5	0.7	0.6	0.7
Polish	0.3	****	****	****
Bashkir	0.3	****	0.1	0.1
Udmurt	0.3	****	****	****
Mari***	0.2	****	****	0.1
Chechen	0.2	****	****	****
Yiddish	0.2	****	****	****
Others	2.3	3.3	1.0	0.9
Total	100.0	100.0	100.0	100.0

*Includes Crimean Tatar, not separately stated in 1959 but separately stated in 1969.

**Includes Romanian, separately stated in 1959 and 1969.

***Includes two dialects each of Mordvin and Mari, not separately stated in 1959 but separately stated in 1969.

****Less than 0.05%.

25X1

FIGURE 89. PRINCIPAL SOVIET NEWSPAPERS

NAME	FOUNDED	PUBLISHED BY	SINGLE-ISSUE CIRCULATION (1969)
PRAVDA (Truth).....	1912	CPSU.....	8,350,000
IZVESTIYA (News).....	1917	Supreme Soviet.....	8,300,000
GUDOK (Whistle).....	1917	Ministry of Communications, Railway Transport Workers Union.	*610,000
TRUD (Labor).....	1921	AUCCTU.....	3,450,000
KRASNAYA ZVEZDA (Red Star).....	1924	Ministry of Defense.....	*2,400,000
KOMSOMOL'SKAYA PRAVDA (Komsomol Truth).....	1925	Komsomol.....	7,050,000
SEL'SKAYA ZHIZN' (Rural Life).....	1929	CPSU.....	6,550,000
SOVETSKIY SPORT (Soviet Sport).....	1933	AUCCTU, Union of Sports Societies and Organiza- tions.	*2,700,000
SOVETSKAYA ROSSIYA (Soviet Russia).....	1956	CPSU.....	2,900,000
SOTSIALISTICHESKAYA INDUSTRIYA (Socialist Indus- try).	1969	CPSU.....	600,000

*1968.

The majority of papers use essentially the same makeup techniques. The same stories are displayed each day in about the same way by all papers. Often several papers will use identical stories in identical positions, often under identical headlines and accompanied by identical pictures. Journalistic language is highly stylized, and in discussions of certain questions on which there has been no "final" decision, subtle variations may be used to signal controversial opinions. A typical Soviet newspaper is arranged as follows: page 1 carries government notices, official bulletins, and usually a long editorial; pages 2 and 3 generally contain national news, letters, special articles, and sometimes a feuilleton (a semifictional feature story with a political moral); and page 4 is given over to foreign news provided by TASS, athletic events, and a potpourri of other items. Any advertising is principally government advertising or that concerning public events such as sports competitions and theater offerings. A clutter of small personal advertisements about such things as marriages, divorces, and deaths also appear—items required by law to be published.

Soviet newspapers do not attract readers by any of the sensational elements, brashness, or popular feature articles so common in most Western countries. Furthermore, ideological correctness of interpretation rather than speed in reporting news events is the guiding criterion. The contents of Soviet newspapers, perhaps dull from a Western perspective, are not without personal interest. This is taken care of by the extensive use of readers' letters criticizing petty official lapses and stories telling of action taken as followups to these letters.

In recent years, makeup and typography have improved significantly. Great care is now given in most papers to achieve esthetic layout and harmonious typography, and the use of pictures has increased. *Izvestiya*, for example, typifies some of the best layout practices in the world, and the paper presents what in a Western sense might be termed an attractive package.

It is probably safe to say, however, that newspaper readers in Scandinavia, the United Kingdom, or the United States would still find the Soviet press colorless and staid, perhaps even dull in its format.

The press leader in the U.S.S.R. is *Pravda*, which sets the pace not only in ideological questions but also in general editorial and mechanical matters. *Pravda* distributes its approximately 8.4 million copies daily nationwide from printing plants in Moscow and 15 other cities. It rushes page mats to the more distant of its printing sites each night by jet planes. Distribution of *Pravda* texts was facilitated in 1970 by the introduction of a photoelectric process transmitted by communication satellite. *Pravda* is packed with serious news, announcements, and speeches, but occasionally the newspaper engages in some heavy-footed humor in its feuilletons. By virtue of its position as the highest party press organ, *Pravda* feels free to criticize other newspapers and at the same time is immune from criticism. Most of its foreign news comes from TASS, but the paper also maintains some 60 of its own correspondents abroad. Within the U.S.S.R. *Pravda* has about 40,000 correspondents, both professional and amateur, whose function is not only to channel any important news back to Moscow but also to keep a check on the republican and local newspaper operations.

Pravda sets a magisterial journalistic tone. It does not write down to its readers. Editorials are always prominently displayed, usually in the left-hand column, although on occasion the whole front page is one long editorial. The usual emphasis is on foreign and internal policy, with industry, propaganda, party organization, agriculture, cultural affairs, and military policy following in that order. These articles are reprinted throughout the Soviet press, usually being sent by TASS via voice radio to be copied down simultaneously in the various local and republic newspaper offices. Through such means, as well as through its elaborate publishing and distribution network, *Pravda* is the most truly national newspaper in the U.S.S.R.

Soviet magazines included 1,185 separate titles and comprised more than 80% of total periodical circulation in 1969. The remaining 4,368 periodical titles were divided among small-circulation publications such as "agitators' notebooks" designed for party propaganda, scientific and scholarly transactions, and bulletins. As a rule Soviet magazines range in price from 10 to 30 kopecks, with glossy and literary journals ranging from 60 to 80 kopecks. Within the magazine category, there are several fairly distinct groups: party journals such as *Partiynaya Zhizn'* (Party Life) dealing with questions of organization, propaganda, agitation, current policies, and other practical matters; ideological or theoretical journals such as *Voprosy Filosofii* (Problems of Philosophy) dealing with current policy or historical approaches to ideological questions; literary journals such as *Novyy Mir* (New World) and *Oktyabr'* (October) publishing new fiction and literary criticism and serving as forums for debates between "liberals" and "conservatives"; trade or professional journals such as *Zhurnalist* (Journalist) serving as organs of professional associations and occupational groups; health and sports journals, such as *Zdorov'ye* (Health); magazines oriented toward a subsection of the population, particularly youth and women, such as *Rabotnitsa* (Woman Worker); humor magazines, such as *Krokodil* (Crocodile); journals for foreign distribution, such as *Sputnik*; popular science, such as *Tekhnika Molodezhi* (Technology for Youth); digests of translations from foreign publications, such as *Za Rubezhom* (Abroad); academic and scholarly journals, such as *Vestnik Akademii Nauk* (Herald of the Academy of Sciences); and general popular magazines such as *Ogonek* (Little

Flame). Figure 90 provides data on selected major magazines.

While the format and content of Soviet magazines have become much livelier in recent years, they are still staid when compared with Western styles. More than 90% of all periodicals, including magazines, are still printed on paper roughly equivalent to newsprint stock. Layout and design suffer not only from the general backwardness of Soviet commercial art but from the poor quality of materials available. Even if there is an improvement in appearance, the basic purpose of magazines and newspapers in Soviet society to indoctrinate the people and mobilize them for assigned tasks is not likely to change.

b. NEWS AGENCIES—There are two Soviet news agencies, Telegraphic Agency of the Soviet Union (*Telegrafnoye Agentstvo Sovetskogo Soyuza*—TASS) and News Press Agency (*Agentstvo Pechati Novosti*—APN) often referred to as just *Novosti*. The former concentrates on official government and political information, while the latter is more apt to report offbeat propagandistic items.

TASS was founded in 1925, taking over most of the functions of an agency called ROSTA, which operated from 1918 to 1925 as the chief national news agency. From 1925 to 1935 there were five internal wire agencies in the U.S.S.R., including ROSTA which covered the R.S.F.S.R., but in 1935 they were consolidated and incorporated into TASS. The agency's leading position in the news realm is reinforced by its attachment to the Council of Ministers of the U.S.S.R. Today the agency maintains "feeder" services in all 15 republics of the U.S.S.R. and averages over 3 million

FIGURE 90. SELECTED MAJOR SOVIET MAGAZINES

25X1

NAME	FOUNDED	PUBLISHED BY	SINGLE-ISSUE CIRCULATION (1970)
PARTIYNAYA ZHIZN' (Party Life)	1919	CPSU	927,000
KOMMUNIST (Communist)	1925	CPSU	808,000
AGITATOR	1956	CPSU	1,075,000
POLITICHESKOYE SAMOOBRAZOVANIYE (Political Self-Education)	1956	CPSU	**1,400,000
RABOTNITSA (Woman Worker)	1914	<i>Pravda</i>	**10,800,000
KREST'YANKA (Peasant Woman)	1922	<i>Pravda</i>	**5,840,000
KROKODIL (Crocodile)	1922	<i>Pravda</i>	5,100,000
OGONEK (Little Flame)	1923	<i>Pravda</i>	2,100,000
PIONER (Pioneer)	1924	Pioneer organization	**1,139,000
VOKRUG SVETA (Around the World)	1927	<i>Komsomol</i>	2,700,000
TEKHNIKA-MOLODEZHI (Technology for Youth)	1933	<i>Komsomol</i>	1,500,000
NOVYY MIR (New World)	1925	Union of Writers	160,000
YUNOST' (Youth)	1956	Union of Writers	1,800,000
NAUKA I ZHIZN' (Science and Life)	1934	<i>Znaniye</i> Society	2,900,000
SEM'YA I SHKOLA (Family and School)	1946	Academy of Pedagogical Sciences	*1,400,000
ZDOROV'YE (Health)	1955	Ministry of Health, Union of Medical Workers	**9,759,000
SLUZHBА BYTA (Public Service)	1962	Ministry of Public Service, R.S.F.S.R., Union of Local Industry and Municipal Public Service Workers	*1,500,000

*1968.

**1969.

words daily to and from its offices in 95 countries and territories. Despite all this, the Soviet public receives only a carefully selected part of the foreign news each day. Many major events are never made public, while minor incidents which support the regime's position are publicized.

Some 5,000 Soviet newspapers as well as the major radio and TV stations subscribe to TASS. They pay according to their circulation or listening audience, and the agency operates on these fees. Within the Soviet Union TASS news is supplied in Russian, while services for foreign countries are transmitted in Russian, English, French, German, Spanish, and Arabic. It is hard to give the exact number of foreign recipients of TASS services, because newspapers and radio stations in many countries secure them through national news agencies which reserve to themselves the exclusive rights for the dissemination of news. Agreements have been concluded with some 30 agencies, including Reuters, AP, UPI, AFP, Kyodo, and DPA, as well as the agencies of the Communist countries.

APN was founded in 1961 under the sponsorship of the Union of Journalists, the Union of Writers, the *Znaniye* Society, and the Union of Soviet Societies of Friendship and Cultural Relations With Foreign Countries. The news agency provides feature stories, commentaries, news items, interviews, and photos. The service to foreign newspapers, news agencies, and radio and TV stations deals with various aspects of life in the Soviet Union, while the domestic service to Soviet subscribers deals mainly with the way of life of foreign nations.

According to its charter, APN is a completely autonomous body, cooperating with official information services but not affiliated with them. In 1969 it was providing feature copy to more than 600 Soviet newspapers and was contributing to some 6,000 newspapers abroad. It has bureaus or correspondents in 73 countries. Foreign correspondents in the U.S.S.R. must rely on APN for their stories. APN is responsible for some of the glossier Soviet publications, including *Sputnik* and *Soviet Life*, the counterpart to *USIS' Amerika*, issuing altogether some 52 magazines, eight newspapers, and more than 100 press bulletins abroad with a circulation of 2.7 million copies. In addition, APN publishes books and pamphlets and produces films for television. In effect, the purpose of the agency is to counteract whatever the regime believes is hostile propaganda about life in the U.S.S.R. Its function as a public relations agency is facilitated by its "public" rather than state sponsorship.

3. Books, libraries, and museums

a. Books—Of the 74,587 books and pamphlets published in the U.S.S.R. in 1969, only slightly more than 55% fit the UNESCO definition of a book—a publication 49 or more pages in length. The following

tabulation compares the subject breakdown for books and pamphlet titles appearing in 1967:

CATEGORY	BOOKS	PAMPHLETS	TOTAL
General	1,023	1,299	2,322
Philosophy	505	253	758
Religion	122	92	214
Social science	9,483	7,395	16,878
Philology	1,700	304	2,004
Pure science	3,938	2,088	6,026
Applied science	14,026	19,221	33,247
Arts	1,294	1,115	2,409
Literature	6,304	1,629	7,933
Geography-history	1,750	540	2,290
Total	40,145	33,936	74,081

Comparable figures for the United States in 1967 were 58,877 book and pamphlet titles, of which 51,114 were books.

The technical quality of Soviet books is generally lower than that of books printed in the United States. The paper is thinner and frequently turns yellow and becomes brittle after a few years. The quality of printing is also low by U.S. standards, the impression often being uneven and the letters visible through the page. There are frequent misprints, and errata slips in books and journals are common. The covers on Soviet books are weaker than those on their U.S. counterparts, and pages and covers are usually sewn together with light thread, with the result that the binding is easily torn from the book.

Soviet books are relatively inexpensive in comparison with other consumer goods. The price of a book as well as the size of its edition are determined by its subject matter. Those on political subjects are cheap and plentiful; others, for more restricted circulation, cost more. Publishing houses can offer books at low prices because they are exempt from all taxes and receive subsidies from the state. They are assured of a market by the very large demand among the population, but are often unable to satisfy it because of the limited quantities of paper available. A would-be purchaser often must order well in advance of publication to receive a copy.

In book production, as in other areas involving consumer tastes, there is a chronic problem with unsold goods. Each year thousands of editions remain unsold, while others issued in smaller editions disappear from the stores within hours of their appearance. Second-hand books are an important means of filling the gap in the book trade, usually being bought back from the public at approximately 80% of their original cost, and if in reasonably good condition they are resold as new. Although no analysis of the categories of books which remain unsold and those which sell well has been made public, the speed with which certain "controversial" works disappear from the shelves suggests that many of the unsold volumes so slavishly follow the regime-approved line as to promise only boredom for the reader.

b. LIBRARIES, MUSEUMS, AND OTHER INSTITUTIONS—The Soviet Union has an extensive library system.

FIGURE 91. SOVIET LIBRARIES AND COLLECTIONS, 1913-68

	1913	1940	1960	1968
All libraries:				
Number of libraries (<i>thousands</i>)...	76	277	382	347
Number of books and magazines (<i>millions</i>).....	46	527	1,890	2,588
Public libraries:				
Number of libraries (<i>thousands</i>)...	14	95	136	125
Number of books and magazines (<i>millions</i>).....	9	185	845	1,198
School and children's libraries:				
Number of libraries (<i>thousands</i>)...	59	164	196	171
Number of books and magazines (<i>millions</i>).....	22	68	277	385
Technical and other specialized libraries:				
Number of libraries (<i>thousands</i>)...	3	18	50	51
Number of books and magazines (<i>millions</i>).....	15	274	768	1,005

Figure 91 outlines the growth in number of libraries and the size of their collections by type from 1913 to 1968. The major libraries include the V.I. Lenin State Library of the U.S.S.R. in Moscow (founded 1862), comparable in status with the Library of Congress, with more than 23 million volumes; the M.E. Saltykov-Shchedrin State Public Library in Leningrad (founded 1795), with 14 million volumes; the Library of the Academy of Sciences of the U.S.S.R. in Leningrad (founded 1714), with more than 8 million volumes; the State Public Library of the Academy of Sciences of the Ukraine in Kiyev, with about 8 million volumes; the A.M. Gor'kiy Research Library of the Moscow State University, with about 6 million volumes; and many others.

Although quantitatively impressive, the Soviet library network leaves something to be desired qualitatively. The premises of individual libraries are frequently run down, with wornout furnishings and outmoded equipment. Literature in the collections is often out of date, and cataloging usually is far behind acquisitions. Because of low-quality book production, the libraries are faced with a nearly insuperable problem of deterioration of their collections. Many public libraries are crowded, poorly lit, inconveniently arranged, and frequently cluttered and unpleasant. Some buildings are even critical fire hazards. The major collections named above, however, are in capacious quarters and have facilities comparable with the best in the West.

Soviet museums run the same gamut as the libraries, from those of world stature to the woefully inadequate. In 1969 there were 1,116 museums, visited by 96 million persons. The principal types were regional (489), memorial (222), art (165), historical (168), and natural science (36). The largest museums are the V.I. Lenin Central Museum (general), the Museum of the Revolution, the Kremlin Armory (crown jewels, thrones, imperial robes, carriages, etc.), the Historical Museum, the Polytechnic Museum, the A.S. Pushkin Museum of Decorative Arts (featuring a small collection of French

impressionists, Egyptian and Greek art, 18th century Western-inspired furniture and painting), and the Tretyakov Gallery (featuring a superb collection of icons and 19th century Russian art)—all in Moscow; the Hermitage (featuring a collection of painting, furniture, coins, gems, and other objets d'art comparable in quality and quantity with the Louvre), the Russian Museum (history and art), and the Museum of Anthropology and Ethnography in Leningrad; and the Historical Museum and the Museum of Ukrainian and Russian Art in Kiyev. In the past, Soviet museums limited the display of their early modern art collection to approved individuals only, but of late they have come to realize the value of showing them off to the numerous foreigners shepherded through their galleries by Intourist, and so these works have increasingly been taken out of the museum "reserves" and rehung.

In addition to libraries and museums the U.S.S.R. is dotted with "houses of culture," city and rural clubs, "houses of science and technology," "popular universities," parks of "culture and rest," and other "cultural-enlightenment" institutions. Their functions are to propagate political and scientific knowledge, to disseminate the achievements of science, technology, art, and literature, and to provide cultural activity for workers in their leisure time. In 1969 there were 133,000 such institutions—sponsored variously by the Ministry of Culture, the Komsomol, trade unions, and collective farms—which served as centers for lecture programs, movies, small libraries, and study programs.

4. Theater and motion pictures

a. THEATER—Though considered primarily an art form in the West, the theater since the onset of the Soviet regime has been recognized as a powerful instrument of mass agitation and propaganda. The theater had been resisted vigorously by the Orthodox Church as a pagan practice from at least the 11th to the 17th century, but the subsequent introduction of Western cultural forms under the auspices of the court brought an end to church bans on this medium. Professional dramatic theaters were well established by the mid-18th century, chief among them the Malyyi Theater in Moscow and the Aleksandrinskiy (now Pushkin) in Saint Petersburg, and such notable writers for the stage as A.P. Sumarokov and D.I. Fonvizin produced a large body of works for them. In the 19th century A.S. Griboyedov and A.N. Ostrovskiy made notable contributions to theatrical literature, as did Pushkin, Lermontov, Gogol', Turgenev, Tolstoy, Dostoyevskiy, Chekhov, and Gor'kiy.

The Russian theatrical style of psychological realism had taken hold as early as the 1840's, and from the demands of this style the actor identify internally with the character he was playing, the famous Moscow Art Theater style developed at the end of the 19th century under the aegis of K.S. Stanislavskiy and V.I. Nemirovich-Danchenko. The Moscow Art Theater went through several phases in its quest for style and

repertory before the highly prized "Stanislavskiy method" crystallized in the early Soviet period. In the process new directorial talent was developed, and many of the younger generation went on to form their own theaters and styles, including V.E. Meierkhol'd (Meyerhold), Ye. B. Vakhtangov, and A. Ya. Tairov.

All stylistic innovation was brought to a halt by the end of the 1920's, when the regime decided that only an approved "socialist realist" style could adequately serve its propagandistic purposes. In part the crackdown was a reaction to the flowering in the NEP period of highly experimental and vigorously contending theatrical groups whose efforts to combine extreme and esoteric modern art forms with Communist ideology, as in the works of V.V. Mayakovskiy, left less intellectual members of the party bureaucracy cold. A series of party resolutions demanded a break with "bourgeois-esthetic, decadent, formalist" styles and a return to the utilitarian realism characteristic of mid-19th century Russian theater. Despite these restrictions, worthwhile plays by such writers as M.A. Bulgakov, Yu. K. Olesha, A.E. Korneychuk, N.F. Pogodin, and K.M. Simonov did appear. Although works of the 1930's were effectively staged, they were characterized by monotony of theme and by a predictable contrast between "negative" characters (spies, secret enemies of Soviet power) and the idealized, hackneyed "positive" images of Communist heroes. The curtain finally fell on Soviet theatrical originality during the purges in the late 1930's, when a series of theaters suspected of "formalism" were shut down and such great directors as Meierkhol'd and Stanislavskiy were arrested or died.

Since that period Soviet theater has been marked by high technical skill in production and acting style, particularly in the 19th century classics, but little thematic or literary ingenuity. During the "thaw" in the mid-1950's some of the previously banned works of the 1920's were allowed to be presented, but little original has been created. The theater arts by and large follow the party line, though there are exceptions. Even in officially approved presentations, moreover, there are occasional veiled criticisms of the regime. Despite the falling off in the quality of new Soviet plays, theater in the U.S.S.R. as a total experience continues to enjoy considerable popularity, in part because of the traditional love of theater and the enthusiasm for culture and in part because theater provides an escape from the drabness of everyday life.

As of 1969 there were 543 professional theaters, including 40 theaters of opera and ballet, 361 theaters of drama and musical comedy, and 142 children's and puppet theaters. These were visited by 110 million paying theatergoers in the course of the year. In 1965 there also were 907 amateur theaters, attended by more than 14 million persons. In addition to the Moscow Art Theater and Mal'yi Theater in Moscow and the Pushkin Theater in Leningrad, some of the better known Soviet theaters include the Vakhtangov Theater, the Pushkin Theater of Drama, the Theater of Satire, the Obraztsov

Puppet Theater, and the Mossovet Theater in Moscow, and the Gor'kiy Dramatic Theater in Leningrad. Since the mid-1950's several new theaters have been founded in Moscow for young actors, directors, and writers whose productions are daring by Soviet standards. These include the Sovremennik Theater and the Moscow Theater of Drama and Comedy, locally known as the Taganka. Their audience is largely composed of students and intellectuals who find the older theaters too smothered in tradition.

b. MOTION PICTURES—Lenin called the cinema "the most important of the arts" and fully appreciated its importance as a medium of information and persuasion. For him and his successors entertainment was strictly secondary. Before the 1917 revolution the influence of motion pictures was slight, most people regarding them as an interesting novelty to amuse the literate urban population. The entertainment provided was escapist, sentimental, romantic, scarcely adult; the better subjects were adaptations of Russian literary classics. In 1919 the Soviet Government nationalized the film industry and began to shape it into an implement of Communist propaganda. The process took a decade to become effective, and during that time enthusiasm for the revolution and a shortage of trained personnel and technical equipment stimulated a sustained period of innovation in cinematic techniques and story method.

By the mid-1920's a group of young directorial talents emerged, including S.M. Eizenshtein (Eisenstein), V.I. Pudovkin, G.M. Kozintsev, L.Z. Trauberg, and A.P. Dovzhenko. Among the classics of this period are "Strike," "Battleship Potemkin," and "October" by Eizenshtein, and "Mother," "The End of Saint Petersburg," and "The Offspring of Genghis Khan" by Pudovkin. Eizenshtein in particular experimented extensively in the medium, and he is generally credited with creating the documentary film form. Yet no matter how much international acclaim the Soviet film industry received, it could not avoid denunciation by the regime for being overly "formalist," and by the 1930's the "socialist realist" dogma was superimposed on this medium, too.

The authorities took an active interest in the film industry and imposed an ever-narrowing political censorship, with the result that it took 40 years just to restore the quantity of feature film production to the prerevolutionary level of more than 100 feature films a year. The situation during the years of Stalin's rule became so acute that by 1952 only five feature films were released out of the 100 planned. The emergence of occasional masterpieces in the 1930's such as M.S. Donskoy's "Childhood of Maxim Gorki" or Eizenshtein's "Alexander Nevsky" made the decline in this field all the more poignant. During the purge of the late 1930's, many film workers were arrested and some shot, and all signs of artistic independence were obliterated. Eizenshtein took advantage of a brief easing during the war years to produce "Ivan the Terrible," but in 1946 he

and his fellow directors were attacked during Zhdanov's campaign to reestablish ideological conformity. The film industry, with its high proportion of Jewish personnel, was particularly vulnerable when the party began its "struggle against cosmopolitanism," a veiled form of anti-Semitism.

The film industry began to revive in 1956, and since then it has again been receiving the international recognition it earned in the 1920's. Works by older directors such as S.I. Yutkevich's "Othello" and G.M. Kozintsev's "Don Quixote" and "Hamlet" have appeared side by side with younger men's works, such as "The House I Live In" directed by L.A. Kulidzhanov and Ya. A. Segel', "I Am 19 Years Old" by M.M. Khutsyev, "The Cranes Are Flying" by M.K. Kalatozov, and "War and Peace" by S.F. Bondarchuk. Perhaps the most creative of the postwar film directors is G.N. Chukhray, whose "The Forty-First," "Ballad of a Soldier," and "Clear Sky" are notable for their sensitivity in treating contemporary themes.

In 1969 the Soviet film industry produced 196 feature-length films (including films for television), of which 159 were artistic and 37 were documentary and instructional. In addition, 1,187 short subjects were produced. There were 21 movie studios devoted to art films and 19 to documentary and instructional films. The largest of the former are the Mosfilm and Gor'kiy studios in Moscow, Lenfilm in Leningrad, and Dovzhenko in Kiyev. All studios are administered by the state, and their production is planned in the same way as book production—on the basis of ideological demands rather than box-office appeal.

At the end of 1969 there were 146,400 motion picture theaters supplemented by 10,500 projection teams which traveled about the country, mostly in rural areas. During the same year 4.7 billion tickets were sold, for an average of 19 visits to the movies per person. The following tabulation compares movie attendance per person in selected countries in 1967-69:

U.S.S.R.	(1969) 19	Yugoslavia	(1969) 4
Italy	(1967) 11	United Kingdom ..	(1968) 4
United States ...	(1967) 7	France	(1968) 4
East Germany ...	(1969) 5	West Germany ...	(1968) 3
Poland	(1969) 4	Japan	(1968) 3

In forming a picture and giving the flavor of the U.S.S.R. the Soviet film has been to the rest of the world what the Russian novel was in the past. Its impact on the art of film-making worldwide has probably been comparable to that of the Russian novel on literature. Despite the regime's restrictions on self-expression, Soviet film directors and technicians have produced films that are acknowledged to be world masterpieces.

5. Radio and television

Radio and TV broadcasting rank with the press as the most active information media and means of political, cultural, and esthetic "education" of the people. Wireless telegraphy was invented in Russia in 1896 by A.S. Popov simultaneously with, and independently of,

Marconi. Sound broadcasting began in 1922 from a transmitter in Moscow, and 2 years later there were three more transmitters functioning in Leningrad, Kiyev, and Nizhniy Novgorod (Gor'kiy). TV transmissions began experimentally in 1931, and the first TV studios opened in Moscow and Leningrad in 1938, the third opening in Kiyev in 1951. By 1969 there were approximately 500 radio stations in operation, of which approximately 45% were long and medium wave, 25% shortwave, and 30% FM stations. There were also 130 TV transmitting stations, supplemented by some 620 retransmitting stations.

The coverage of the radio and TV networks is quite comprehensive, facilitated by the extensive use of wired radio sets. According to Soviet statistics, in 1969 there were 120.9 million radio-receiving points, a term which includes wired and wireless radios and TV sets. The following tabulation outlines the growth in the number of radio-receiving points since 1940 (in millions):

	1940	1960	1965	1969
Wireless radios	1.1	27.8	38.2	46.7
Wired radios	5.9	30.8	35.6	43.4
Television sets	*	4.8	15.7	**30.8
Total	7.0	63.4	89.5	120.9

*400 sets.

**Includes 15,000 color TV sets.

In terms of the availability of radio and TV sets per thousand population, the Soviet Union ranks behind some but not all of the more advanced industrial nations, as may be seen in the following tabulation for 1967:

	RADIO	TELEVISION
United States	1,431	392
West Germany	464	231
United Kingdom	318	263
East Germany	344	228
U.S.S.R.	342	96
France	306	167
Japan	255	200
Italy	222	147
Poland	173	92
Yugoslavia	153	50

Facilitating the transmission of radio and television in the U.S.S.R. have been the 14 *Molniya-1* communication satellites, successively launched into high elliptical orbits beginning in 1965. Plans have been made to expand the communication satellite network with the introduction of the *Molniya-2* and *Statsioner* satellites in the 1970's.

Radio Moscow, the central broadcasting station, transmits five simultaneous programs for listeners throughout the Soviet Union on all wavelengths. The first program is the basic one, transmitting political, cultural, and economic information 20 hours daily to all parts of the Soviet Union. The second program, called *Mayak* (Beacon), broadcasts light music and hourly newscasts around the clock. The third program has a more serious content, with radio plays and classical

music, broadcasting 16.5 hours daily to the central regions of the European part of the U.S.S.R., the Transvolga, and the Urals. The fourth program is beamed over the AM and FM bands to the population of the Moscow region, transmitting 8 hours daily during the week and 13 hours daily on the weekends. The fifth program is transmitted around the clock for Soviet citizens abroad, seamen of the commercial and fishing fleet, and foreigners knowing Russian. There is 1 hour of stereo broadcasting daily on the Moscow FM station. Overall, *Radio Moscow* broadcasts approximately 650 hours a week. Local stations broadcast an additional 6,000 hours weekly. Music occupies 55.3% of total broadcasting time, news 16%, social and political items 10.6%, literature and drama 9%, programs for children and young people 6.6%, and other programs 2.5%.

Radio Moscow and *Radio Peace and Progress* (the stations bear essentially the same relationship to each other as TASS and APN) broadcast programs for listeners abroad on short and medium wave in 82 languages. The programs were beamed to all parts of the world, as of 1970, for an estimated 1,897.5 hours a week, second only to the combined efforts of the Voice of America, *Radio Free Europe*, and *Radio Liberty*. According to a Soviet source, the task of these programs is to describe the life of the Soviet people, explain the foreign and domestic policy of the Soviet state, reveal the aggressive policies of imperialism, and discuss the struggle of the working class and the national liberation movement of peoples struggling for their independence.

The Central Television Network, operating out of Moscow, transmits four simultaneous programs. The first program, lasting 10 hours daily during the week and 15 hours daily on weekends, is devoted to the "important events of national and international life." The second program, lasting 5 hours daily during the week and 7 hours daily on weekends, is directed to the city of Moscow and its environs. The third program, 6 hours daily 6 days a week, is devoted to educational television. The fourth program transmits in color 3.5 hours daily. Altogether the transmitters of Moscow Television are on the air approximately 180 hours weekly. Local stations transmit an additional 4,800 hours weekly. Films occupy 22% of total TV transmission time, literature and drama 19%, music 18%, news 17%, programs for children and young people 14%, social and political items 8%, and miscellaneous material 2%.

Soviet television operates on the standard European 625-line definition. Microwave, coaxial cable, and communication satellite relay systems have been introduced or are being developed, principally to retransmit TV broadcasts from Moscow. Experimental color transmission was begun in 1959, but it proved unsuccessful. In 1965 the U.S.S.R. and France agreed to pool their efforts in color TV transmission on the basis of the French SECAM-4 system. To facilitate color transmission, one of the largest TV centers in the world was built in Ostankino, near Moscow. It is capable of

broadcasting five TV channels (four VHF and one UHF) and six FM stations simultaneously. The Soviet Union planned to transmit 50 hours of color television weekly by the end of 1970.

The Soviet radio and TV broadcasting networks belong to the International Organization of Radio-broadcasting and Television (OIRT). Its networks are tied together with those of Eastern Europe, and a TV network called Intervision, sponsored by OIRT, facilitates the exchange of programs of international significance, such as soccer matches and the May Day and 7 November celebrations. The link between the Soviet and Western radio and TV networks is made between Tallin and Helsinki. The Soviet Union engages in exchanges of programs with some 90 countries.

When it comes to unauthorized penetration of Soviet airspace, however, the regime is less cooperative. The government maintains an extensive system of radio jammers, numbering between 2,000 and 2,500, capable of blocking reception by wireless radios. Since World War II, jamming has changed in accordance with the tensions of the cold war. In broadcasting, relations between East and West were reflected during the Berlin crisis in 1948. At that time the Russians started jamming the various Soviet-language (Russian, Ukrainian, Armenian, Georgian, Estonian, Latvian, Lithuanian) broadcasts of the Voice of America (VOA), and a year later those of the British Broadcasting Corporation (BBC). Jamming was soon extended to almost all Western broadcasts to the Soviet Union and its allied countries and also to some other countries. Beginning in 1956, jamming of BBC and VOA Soviet-language transmissions was reduced and finally halted in 1963 following the signing of the nuclear test ban treaty. On the other hand, heightened tensions between the Russians and Chinese after 1963 led to systematic and heavy Soviet jamming of Chinese Communist transmissions by the late 1960's. Jamming of BBC and VOA transmissions to the Soviet Union resumed after the Soviet invasion of Czechoslovakia in 1968, but it has not returned to the peak pre-1963 levels. Jamming of *Radio Liberty* and *Radio Free Europe* has continued throughout this period without letup.

J. Suggestions for further reading

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There is no shortage of material about the Soviet Union, and indeed the prospective user of such material faces the problem of selecting the most recent and most sound of the thousands of items appearing in English and other languages each year. Almost without exception the works appearing under Soviet imprint must be used with the utmost caution. Outright lies seldom appear in Soviet publications, but the constant use of shading, highlighting, blurring, or intense focusing in order to come up with the most favorable picture of the U.S.S.R. may trap the unwary reader. Even Soviet statistical works share these characteristics and must therefore be cross-checked against outside sources before being given credence. The following

listing is narrowly selective of the many sources available treating the subjects discussed above and cannot but be rapidly made obsolete by new information in the field of Soviet studies.

1. Bibliographic and other general reference works

Horecky, Paul L. (ed) *Basic Russian Publications; An Annotated Bibliography on Russia and the Soviet Union* (Chicago, Chicago University Press, 1962)

———. *Russia and the Soviet Union; A Bibliographic Guide to Western Language Publications* (Chicago, Chicago University Press, 1965) This complementary pair of titles is perhaps the most useful as a point of departure in the vast area of Soviet studies. Their organization is uncomplicated and annotations concise. More recent works in English are catalogued in the following publications:

Dossick, Jesse J. *Doctoral Research in Russia and the Soviet Union* (New York, New York University Press, 1960) Includes American, Canadian, and British dissertations from 1876 to 1959. Updated annually in the December issue of *Slavic Review* beginning in 1964. A cumulative volume covering 1960-70 is in preparation.

J.T. Shaw (ed) *The American Bibliography of Slavic and East European Studies, 1956* (Bloomington, Indiana University Press, 1957) An annual which includes works printed in foreign languages in the United States and Canada as well as works in English printed by American and Canadian authors abroad. Indexes journal articles and major book reviews.

The major English-language journals devoted to Soviet affairs are as follows:

Slavonic and East European Review (London 1922-present)

Slavic Review (Seattle, Washington 1940-present)

Russian Review (Hanover, New Hampshire 1941-present)

Soviet Studies (London 1949-present)

Current Digest of the Soviet Press (New York 1949-present)

Problems of Communism (Washington 1952-present)

Survey (London 1956-present)

Studies on the Soviet Union (Munich 1957-present)

Canadian Slavic Studies (Montreal 1967-present)

The Soviet field is blessed with a multiplicity of encyclopedias. For those who read Russian, the following are the most important:

Bol'shaia Sovetskaiia Entsiklopediia, 3rd ed. (Moscow 1969-present) The second edition which appeared in 51 volumes from 1950 to 1958 with annual supplements thereafter and the first edition which appeared in 65 volumes from 1926 to 1947 retain their independent reference value.

Entsiklopedicheskii Slovar' (Granat). 7th ed. (Moscow 1910-48)

Entsiklopedicheskii Slovar' (Brokgauz-Efron) (Saint Petersburg 1890-1907) The above encyclopedias are more of historical interest, but on some subjects, such as

religion, they provide information not easily obtainable elsewhere.

Vvedenskii, B.A. et al. (eds) *SSSR 1917-1967; Entsiklopedicheskii Spravochnik* (Moscow, Sovetskaia Entsiklopediia, 1967) A useful one-volume summary (with interesting omissions) of the achievements of the U.S.S.R. during its first half century.

For those who cannot read Russian the following one-volume English-language reference works, while somewhat dated, are still useful as an introduction.

Florinsky, Michael T. (ed) *McGraw-Hill Encyclopedia of Russia and the Soviet Union* (New York, McGraw-Hill, 1961)

Utechin, Sergei V. (ed) *Everyman's Concise Encyclopedia of Russia* (London, Dent, 1961)

Maxwell, Robert (ed) *Information USSR; An Authoritative Encyclopedia about the Union of Soviet Socialist Republics* (Oxford, Pergamon Press, 1962)

Of the numerous statistical works of general interest, the following provide the broadest coverage and comparisons in depth:

Russia. Tsentral'noe Statisticheskoe Upravlenie. *Narodnoe Khoziaistvo SSSR v 1969g.* (Moscow, Statistika, 1970) The Soviet statistical yearbook.

———. Tsentral'noe Statisticheskoe Upravlenie. *Vestnik Statistiki* (Moscow, 1949-present) The Soviet statistical monthly.

United Nations. Statistical Office. *Statistical Yearbook, 1969* (New York, 1970)

———. Statistical Office. *Demographic Yearbook, 1969* (New York, 1970)

———. Statistical Office. *Compendium of Social Statistics, 1967* (New York, 1968)

2. General characteristics of the society

Riasanovsky, Nicholas V. *A History of Russia*. 2nd ed. (New York, Oxford University Press, 1969)

Florinsky, Michael T. *Russia: A History and an Interpretation* (New York, Macmillan, 1953)

Treadgold, Donald W. *Twentieth Century Russia* (Chicago, Rand McNally, 1959) The above histories are basic in most university courses devoted to Russian history, but they by no means monopolize the field. Riasanovsky manages to compress the entire scope of Russian history into one fat volume, while Florinsky and Treadgold concentrate on the pre- and post-revolutionary periods, respectively.

Fitzsimmons, Thomas et al. *U.S.S.R.: Its People, Its Society, Its Culture* (New Haven, HRAF Press, 1960) An excellent summary of the state of knowledge in Soviet studies, which, while outdated in some respects, is still a most lucid introduction to the complexities of the U.S.S.R. Based on the pioneering work done by the Human Relations Area File Staff.

Whiting, Kenneth R. *The Soviet Union Today; A Concise Handbook* (New York, Praeger, 1962) This work covers much the same ground as Fitzsimmons but has more statistical tables and source citations. Its value is diminished, however, by its consistent bias against the Soviet system.

Kassof, Allan (ed) *Prospects for Soviet Society* (New York, Praeger, 1968) This collection of essays was prepared to coincide with the 50th anniversary celebration of the Bolshevik revolution and provides a useful look ahead into the U.S.S.R.'s sixth decade. Comparable to Fitzsimmons in scope.

Sorlin, Pierre. *The Soviet People and Their Society from 1917 to the Present* (translated from the French by Daniel Weissbort) (New York, Praeger, 1968) A sympathetic look at the accomplishments of the Soviet regime by a French sociologist, with useful tables and charts. Historical rather than casebook approach.

Bauer, Raymond A.; Inkeles, Alex; Kluckhohn, Clyde. *How The Soviet System Works; Cultural, Psychological, and Social Themes* (Cambridge, Harvard University Press, 1957)

Inkeles, Alex; Bauer, Raymond A. *The Soviet Citizen; Daily Life in a Totalitarian Society* (Cambridge, Harvard University Press, 1959) These two studies, the latter containing the data on which the conclusions of the former are based, are classic works derived from interviews with former Soviet citizens and are the closest one can get to an objective sociological study of the Stalin era. They are brought up to date to a very limited extent by the following two anthologies:

Inkeles, Alex; Geiger, H. Kent (eds) *Soviet Society; A Book of Readings* (Boston, Houghton Mifflin Company, 1961)

Inkeles, Alex. *Social Change in Soviet Russia* (Cambridge, Harvard University Press, 1968) The following studies, while narrower in focus, cut across a broad span of problem areas in Soviet society.

Geiger H. Kent. *The Family in Soviet Russia* (Cambridge, Harvard University Press, 1968)

Mace, David; Mace, Vera. *The Soviet Family* (Garden City, Doubleday, 1963)

Brown, Donald R. (ed) *The Role and Status of Women in the Soviet Union*. (New York, Teachers College Press, 1968)

Dodge, Norton T. *Women in the Soviet Economy; Their Role in Economic, Scientific, and Technical Development* (Baltimore, Johns Hopkins Press, 1966)

3. Ethnic and religious groupings

Kolarz, Walter. *Russia and Her Colonies* (New York, Praeger, 1952)

———. *The Peoples of the Soviet Far East* (New York, Praeger, 1954) This pair of books presents the ups and downs of Soviet nationality policy through the Stalin era in Europe and Asia, respectively, and while very outdated still serves as a useful introduction to the subject.

Conquest, Robert. *The Soviet Deportation of Nationalities* (London, Macmillan, 1960) A lucid reconstruction of what happened to a cluster of small nationalities uprooted during World War II and some good statistical detective work on their fate following their "rehabilitation."

Conquest, Robert (ed) *Soviet Nationalities Policy in Practice* (London, The Bodley Head, 1967) A history of

the first half century of Soviet minorities policies and practices with frequent extended citations from the law and press. Part of the Bodley Head Soviet Studies series.

Matthews, W.K. *Languages of the U.S.S.R.* (Cambridge, Cambridge University Press, 1951) A linguistic study and classification with useful maps and charts.

Barghoorn, Frederick C. *Soviet Russian Nationalism* (New York, Oxford University Press, 1956) Treats government policy and ideology with regard to minorities, detailing fluctuations between autonomist and assimilationist approaches.

Goldhagen, Erich (ed) *Ethnic Minorities in the Soviet Union* (New York, Praeger, 1968) A collection of essays on each of the major ethnic groups in the U.S.S.R., using recent statistical data and sources and reviewing most significant developments.

Chornovil, Vyacheslav (comp) *The Chornovil Papers* (New York, McGraw-Hill, 1968)

Dzyuba, Ivan. *Internationalism or Russification; A Study in the Soviet Nationalities Problem* (London, Weidenfeld and Nicolson, 1968) The two latter works concentrate on the contrast between the ideals of Soviet nationality policy and their working out in reality in the Ukraine. The former concentrates on specific violations of Soviet legality while the latter is a more abstract discussion.

Kolarz, Walter. *Religion in the Soviet Union* (New York, Saint Martin's Press, 1961) A basic work detailing the fates of the various religious groups beginning with the immediate prerevolutionary period and carrying the story down to Khrushchev's initial era of toleration. Useful statistical data.

Conquest, Robert (ed) *Religion in the U.S.S.R.* (New York, Praeger, 1968) A concise history of the regime's policy toward religion, with numerous citations from the law and the press. Very thorough gleaning of statistical information. Part of the Bodley Head Soviet Studies series.

Struve, Nikita. *Christians in Contemporary Russia* (New York, Charles Scribner's Sons, 1967) An extended study of Soviet religious persecution, with particular emphasis on Russian Orthodoxy. The author, an emigre, writes from an insider's viewpoint, capturing nuances lost to academicians and journalists.

Bourdeaux, Michael. *Opium of the People; The Christian Religion in the U.S.S.R.* (London, Faber and Faber, 1965) An impressionistic report building on Kolarz, written by an Anglican priest after spending a year in graduate study in the Soviet Union. Better for non-Orthodox than Orthodox groups.

———. *Religious Ferment in Russia; Protestant Opposition to Soviet Religious Policy* (London, Macmillan, 1968)

———. *Patriarch and Prophets; Persecution of the Russian Orthodox Church Today* (New York, Praeger, 1970) These two works are essentially collections of documents concerning the growth of dissent within the Evangelical Christian Baptist and Russian Orthodox

Churches, respectively and the reaction of both the official church organization and the government to it.

Elavi, Ariel L. (Ben Ami, pseud). *Between Hammer and Sickle* (Philadelphia, Jewish Publication Society of America, 1967) An impressionistic account of the state of Russian Jewry by an Israeli diplomat of Russian origin who enjoyed extended opportunities for travel within the U.S.S.R. and apparently was able to get behind the propaganda image devised by the authorities.

Rubin, Ronald I. (ed) *The Unredeemed; Anti-Semitism in the Soviet Union* (Chicago, Quadrangle Books, 1968)

Aronson, Gregor et al. (eds) *Russian Jewry, 1917-1967* (New York, Thomas Yoseloff, 1969)

Kochan, Lionel (ed) *The Jews in Soviet Russia Since 1917* (London, Oxford University Press, 1970) These three works are collections of essays by Jews of American, Russian, and English origin, respectively, which together form the most complete factual picture of the multifaceted history of the Soviet Jewish community in the past half century.

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4. Population, manpower, health and welfare

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International Labor Organization. *Yearbook of Labor Statistics, 1969* (Geneva, 1970)

Conquest, Robert (ed) *Industrial Workers in the USSR* (London, The Bodley Head, 1967)

Brodersen, Arvid. *The Soviet Worker; Labor and Government in Soviet Society* (New York, Random House, 1966) The two latter works use different approaches to cover essentially the same ground. The former, part of the Bodley Head Soviet Studies series, is more highly analytic, relying on extensive quotes from the press and law, while the latter gives a more general picture, using a historical rather than a sectoral framework.

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———. *Labor in the U.S.S.R.* (Washington, U.S. Department of Labor, 1969) These two booklets are collections of essays and notes discussing the more significant recent changes on the Soviet labor scene and containing numerous useful tables and charts.

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Sevianiewicz, S. *Forced Labor and Economic Development; An Enquiry into the Experience of Soviet Industrialisation* (London, Oxford University Press, 1965) This covers the period of the first three 5-year plans (1928-41), analyzing the economic background and investigating the conditions leading to the resort to forced labor. The author is himself a veteran of the system.

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Grant, Nigel. *Soviet Education* (London, University of London Press, 1964) A general introduction for the

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Nozhko, K. et al. *Educational Planning in the U.S.S.R.* (Paris, UNESCO International Institute for Educational Planning, 1968) A more technical description of the educational system, with emphasis on finances, staffing, enrollment ratios, curriculum planning, integration with manpower needs, experimental programs, and other indexes of performance.

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Russia. Vsesoiuznaia Knizhnaia Palata. *Pechat' SSSR v 1969 godu* (Moscow, Kniga, 1970) Annual summary of newspaper, magazine, and book publishing statistics.

Hopkins, Mark. *Mass Media in the Soviet Union* (New York, Pegasus Publishing Company, 1970)

Markham, James W. *Voices of the Red Giants; Communications in Russia and China* (Ames, Iowa State University Press, 1967)

Hollander, Gayle Durham. *Soviet Newspapers and Magazines* (Cambridge, MIT Center for International Studies, 1967)

Durham, F. Gayle. *Radio and Television in the Soviet Union* (Cambridge, MIT Center for International Studies, 1965)

Buzek, Antony. *How the Communist Press Works* (New York, Praeger, 1964)

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Miliukov, Paul. *Outlines of Russian Culture*, parts I-III (Philadelphia, University of Pennsylvania Press, 1943)

Masaryk, Tomas G. *The Spirit of Russia; Studies in History, Literature, and Philosophy*, 3 vols. (New York, Macmillan, 1955-67) These two works are classics in the field of Russian intellectual history and for the most part remain secure in their preeminence, despite the fact that they were written before World War I.

Billington, James H. *The Icon and the Axe; An Interpretive History of Russian Culture* (New York, Knopf, 1966) This work by an American scholar combines some refreshing interpretations and unusual insights with occasional unintentional humor. A provocative, stimulating study, but one to be handled with care.

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Slonim, Marc. *The Epic of Russian Literature; From Its Origins Through Tolstoy* (New York, Oxford University Press, 1964)

———. *From Chekhov to the Revolution; Russian Literature, 1900-1917* (New York, Oxford University Press, 1962)

———. *Soviet Russian Literature; Writers and Problems, 1917-1967* (New York, Oxford University Press, 1967)

———. *Russian Theater From the Empire to the Soviets* (Cleveland, World Publishing Company, 1961)

Bowers, Faubion. *Broadway, U.S.S.R.; Ballet, Theater and Entertainment in Russia Today* (New York, Thomas Nelson, 1959)

Leonard, Richard A. *A History of Russian Music* (New York, Macmillan, 1957)

Leyda, Jan. *Kino; A History of the Russian and Soviet Film* (London, George Allen and Unwin, 1960)

Rice, Tamara Talbot. *A Concise History of Russian Art* (New York, Praeger, 1963)

Hamilton, George H. *The Art and Architecture of Russia* (Baltimore, Penguin Books, 1954)

Sjeklocha, Paul; Mead, Igor. *Unofficial Art in the Soviet Union* (Berkeley, University of California Press, 1967) This work concerns itself with art which does not conform to the approved "socialist realist" style and which has either been withdrawn from or was never allowed into public view. Perhaps the fullest discussion in print.

Pipers, Richard (ed) *The Russian Intelligentsia* (New York, Columbia University Press, 1961) A collection of essays originally appearing in *Daedalus* attempting to define the concept of intelligentsia, comparing the Russian (prerevolutionary) and Soviet (postrevolutionary) intelligentsias, discussing different problems within this group, and comparing the Russian/Soviet group with that in Communist China and Spain.

Conquest, Robert (ed) *The Politics of Ideas in the U.S.S.R.* (London, The Bodley Head, 1967) A concise survey of the development of regime controls over intellectual activity, cultural expression, and the mass media, with extended citations from the press and ideological tracts. Part of the Bodley Head Soviet Studies series.

Yakobson, Sergius. *Aspects of Intellectual Ferment and Dissent in the Soviet Union* (Washington, U.S.

Government Printing Office, 1968) A Library of Congress report summarizing dissidence since the end of the Stalin era, with emphasis on the post-Khrushchev period. Treats not only literature but science, the minorities, religion, and other areas.

The following six titles contain a mere handful of the various protest writings circulated surreptitiously within the Soviet Union and coming by various routes into friendly hands in the West for further dissemination.

Hayward, Max (ed) *On Trial; The Soviet State Versus "Abram Tertz" and "Nikolay Arzhak"* (New York, Evanston, 1966)

Litvinov, Pavel. *The Demonstration in Pushkin Square* (Boston, Gambit Publications, 1969)

Reve, Karel van het (ed) *Dear Comrade; Pavel Litvinov and the Voices of Soviet Citizens in Dissent* (New York, Pitman Publishing Company, 1969)

Marchenko, Anatoly. *My Testimony* (New York, E.P. Dutton and Company, 1969)

Amalrik, Andrey, *Will the Soviet Union Survive Until 1984?* (New York, Harper and Row, 1970)

Brumberg, Abraham (ed) *In Quest of Justice; Protest and Dissent in the Soviet Union Today* (New York, Praeger, 1970) In addition to numerous protest documents and selections from underground literature, contains five brief essays on different aspects of dissent in the Soviet Union, including that among intellectuals, religious groups, and national minorities.

5. Political

In the 24th Party Congress that ended 9 April 1971, as this General Survey was in the final stages of printing, the Politburo of the Communist Party of the Soviet Union was enlarged by four new members and the preeminence of Party General Secretary Leonid I. Brezhnev was reaffirmed. The newly appointed Politburo members were Feodor D. Kulakov, Dinmukhamed A. Kunayev, Viktor V. Grishin, and Vladimir V. Shcherbitsky.

A. General

The U.S.S.R. and its supreme political agency, the Communist Party of the Soviet Union, have evolved from their precursors, the young Russian socialist state and the party of Bolsheviks led by Vladimir Lenin, with significant features of the original ideological and political movement intact. The Soviet regime that celebrated the 50th anniversary of the Russian revolution in November 1967 bore a marked similarity to the state that Lenin had formed during the years of civil war (1918-20). Both were distinguished by a number of purportedly independent political institutions (soviets, trade unions, courts, and so forth) that were subject to complete control by a single party. Government, like the ruling party, was highly centralized so that all decisionmaking was in the hands of a few men. Ideology, considered a vital instrument in wielding political power, was compromised whenever national interests, especially self-preservation, were at stake. Above all, both regimes placed major reliance on force or the threat of force to maintain and extend their ruling power.

During most of the intervening years since the civil war the top leadership of the ruling party has been divided into warring factions. Political infighting has been intense, and frequently—under Joseph Stalin—a matter of life or death. In spite of the difficulties created by such infighting, the U.S.S.R. has become a major world power with broad and complex interests, and the harsher aspects of its internal politics have been moderated.

Soviet Communist Party doctrine provides the framework for all national policies of the U.S.S.R. It is inspired primarily by the revolutionary philosophy of "Marxism-Leninism," which postulates a struggle between so-called capitalist nations of the world and superior "socialist" nations that inevitably will result in the death of capitalism. The Soviet Union has used or threatened to use force to hasten the inevitable "collapse" of capitalism, while at the same time generally avoiding acts which might commit it to a full-scale war. Partly because Communist doctrine promises that a new era of peace and plenty will accompany the triumph of communism, it has won many converts among people not normally subject to Russian

influence. Especially since Stalin's death, however, much of the revolutionary fervor among Communists has been moderated by more realistic appraisals of the possibility of revolutions, and doctrinal considerations increasingly have been overshadowed by traditional great-power politics.

The Soviet regime's claim that the Communist Party, in "monolithic unity" with the people, expresses the will of the nation and thereby has the wholehearted approval of all the people except for a few "politically immature" persons, is highly exaggerated. The small number of leaders of the Communist Party who make national policy are essentially a self-designated and self-perpetuating elite, and Soviet citizens have no opportunity to influence the election of high officials and little chance to effect changes in policy. Most segments of the population have grievances of some sort which affect their attitudes toward the regime. Although the party leadership took steps after Stalin's death to mollify popular discontent over police-state terror and the low level of living, prevailing political attitudes among the populace continue to be those of resignation or apathy.

I. National expansion

Territorial expansion has been characteristic of the Russian state from its beginning. Toward the end of the 15th century the prince of Moscow, partly because of the strategic geographic position of his principality, emerged from the Mongol occupation as the strongest Russian ruler and succeeded in consolidating Russian territory into a united state. Ivan the Terrible (1533-84) extended the territory of the Russian state to the Tatar-held lands of the Volga valley; the penetration of Siberia followed immediately afterward and was virtually completed by the middle of the 17th century. It was not until 1860, however, that Russia succeeded in wresting the Amur valley, including Vladivostok, from the Chinese.

The annexation of what is now the Ukraine and Belorussia began in 1654, when the eastern bank of the Dnepr as well as the city of Kiyev on the west bank were annexed by agreement with the Ukrainian Cossacks. Successive partitions of Poland in 1772, 1793, and 1795 added all of Belorussia, all of Lithuania, and a considerable part of the Ukraine, which were then parts

of Poland. From Sweden, Peter the Great (1682-1725) took Latvia, Estonia, and other territory north of Saint Petersburg (now Leningrad) at the beginning of the 18th century. Catherine the Great (1762-96) wrested the northern littoral of the Black Sea and the Crimea from the Ottoman Empire toward the end of that century. The Russian Empire attached to itself the Grand Duchy of Finland in 1809, annexed Bessarabia in 1812, and took most of what remained of former Polish territories, including Warsaw, in 1815. As a result of a series of wars with Persia and the Ottoman Empire between 1801 and 1829, Russia annexed most of the Transcaucasian region. The penetration of Central Asia had begun a century before, and by the middle of the 19th century five-eighths of the area had been taken; the conquest of the remainder was completed in the second half of the century.

The Russian Empire, when it annexed non-Russian territory, did not disturb the native social structure and frequently did not seriously change local political arrangements. The policy of "Russification," though begun under Nicholas I after the Polish revolt of 1830, was not extensively applied until the reign of Alexander III (1881-94); it is significant that at the time of the February revolution in 1917 none of the minority nationalities, with the exception of the Poles, sought full independence. It was only after the Bolsheviks had seized power in October that most of the more mature minority nationalities sought to sever their Russian ties.

As a result of World War I and the Bolshevik seizure of power in 1917, the new Soviet state lost the Russian-occupied areas of Bessarabia, Latvia, Lithuania, Estonia, Finland, and Poland, including a large part of Belorussia and the Ukraine. In 1939, however, the U.S.S.R. regained the lost areas of Belorussia and the Ukraine—except for the Transcarpathian region which was taken from Czechoslovakia in 1945—and in 1940 the Baltic states, Bessarabia, and part of Finland. In 1945 it annexed the Königsberg (now Kaliningrad) area of East Prussia, Tannu Tuva in Central Asia, and the Kuril Islands and South Sakhalin in the Pacific. With few exceptions, such as the Königsberg area, the U.S.S.R. has generally followed a policy of annexing outright only those areas which had been part of Russia before the revolution.

Although Stalin after World War II directly annexed for the most part only former Russian territories, he extended Soviet influence and control far beyond the limits of prerevolutionary Russia. In areas overrun by the Soviet Army in Eastern Europe, puppet Communist regimes were established. Because of their weakness, these regimes were responsive to Stalin's demands. In the Far East the Soviet Union retained for a time close ties with the Chinese Communists, who had come to power on the China mainland following the war. These ties were based on a common ideology and a degree of overlapping national interests. Soviet influence was extended even beyond this large sphere, since Communist parties, closely controlled and financially assisted by Moscow, were operating in virtually every

country of the world, using a variety of means, including subversion, to promote the interests of the U.S.S.R.

As the postwar situation stabilized, it became increasingly clear that Soviet national interests were not always compatible with those of other Communist nations and parties. In some Eastern European countries the Soviets were only able to maintain their control by force of arms, including open intervention in Hungary and Czechoslovakia. The Chinese rejected Soviet direction and tutelage, proclaiming themselves to be the true embodiment of communism. Smaller Communist regimes and parties began to exploit the conflict between the two major Communist powers to achieve a degree of independence from both.

2. Prerevolutionary political history

The government of the Russian state retained its autocratic character virtually intact until the 20th century. Such authoritarian rule was, however, generally accepted by the masses, who regarded the tsar as their protector against the oppression of the landlords. Unlike Western monarchs, the tsar faced no organized social group capable of exacting concessions, so that his powers were much greater than those of his Western counterparts. The early tsars, including Ivan the Terrible, Boris Godunov, and the first two Romanovs, Michael and Alexis, were assisted by a national assembly called the Zemsky Sobor, which was irregularly called upon for advice at the discretion of the monarch but which ceased to be convened during the reign of Peter the Great. Although various constitutional schemes were considered from time to time by some of the succeeding monarchs, they would have favored only a small part of the nobility, and none was actually put into effect until after the revolution of 1905.

The reign of Peter the Great was marked by the concerted introduction of Western political as well as social influences. Although these influences intensified through the 18th and 19th centuries as Russia assumed a role in the Concert of Europe, internal development lagged behind that in the other important European powers, and by World War I the sprawling empire was only beginning to emerge as a modern industrial society. After several abortive attempts to introduce political and social changes, Alexander II freed the serfs in 1861. Reaction set in, however, especially after Alexander's assassination in 1881, and reforms thereafter never kept pace with the requirements of orderly social, economic, and political evolution. The liberal elements of society, although differing over means, were by now sympathetic with many of the goals of the revolutionaries. The latter maintained pressure on the government, punctuating their demands with further acts of terrorism and biding their time. Severe reverses in the Russo-Japanese War provided the opportunity. The revolution of 1905 finally brought political and social gains, but there was much ground to be covered if the established order was in any sense to be preserved. Further governmental bungling,

including the retraction of granted reforms, followed by military disasters in World War I, led to the two revolutions of 1917, and the old regime was completely swept away.

A fundamental cause of these revolutions was the refusal of various elements in an awakening Russian society to continue to tolerate arbitrary bureaucratic rule. The revolutions occurred in spite of the still rudimentary organization of Russian society and the frequent use of coercive measures by the authorities, including the dread secret police—the Okhrana.

A new political configuration began to emerge in Russia on the eve of World War I. A constitution granted by Nicholas II in 1905 established a nationwide consultative assembly, the Duma, which tended to exert some restraining influence on governmental willfulness. However unequal and indirect the new electoral franchise may have been, all classes of the population participated in the voting. Although some political parties were in theory illegal, in practice a wide range of them, including the Bolsheviks, were able to organize and to elect their representatives to the Duma. Local self-government in the form of elected *zemstvos* (district assemblies) had been firmly established since 1864, and these bodies performed virtually all the functions of local government except those of the police. An independent press developed which, though hindered by censorship, discussed state problems with considerable freedom and was in general highly critical of the government.

3. The regime of Lenin and Stalin

World War I interrupted these developments, precipitated the revolution, and thereby set into motion a new chain of events. After the abdication of the monarchy under prodding from the moderate political leaders in early 1917, inexperienced men took over the reins of the state and formed the Provisional Government. Since they were confused, ineffective, and unwilling to use the coercive apparatus of the state, the Bolsheviks, led by Lenin, easily seized power from them by appealing to the masses with an initial program of land for the peasants and by espousing immediate peace.

The Bolsheviks failed to gain the support of a majority of the people, although they did gain and maintain control of the country and suppressed a disunited opposition in a savagely contested civil war. Economic chaos, imposition of new and more rigid bureaucratic controls, and harsh police rule, including the persecution of many who had fought with the Bolsheviks against the tsarist autocracy, led to a major crisis in 1921. Introduction of the New Economic Policy (NEP) in that year relaxed some of the more cumbersome bureaucratic controls, gave more scope to private initiative, helped to restore the national economy, and thus reduced popular resistance. But the party's position remained insecure in the absence of fully developed political controls.

After Lenin's death in 1924, Stalin gradually gained mastery of the party by staffing its apparatus with persons whose loyalties he could command. He thereupon resolved the policy disputes which had been raging among top party leaders by liquidating the NEP (1928) and instituting a policy of planned, rapid industrialization. Within a year after the initial Five Year Plan (claimed to be completed in 4 years, 1929-32) went into effect, small peasant farms were abolished by herding the peasants, against their will, into collective farms. The sacrifices necessitated by forced industrialization and the collectivization of agriculture greatly increased popular discontent, and the role of the police became more prominent. During the early and middle 1930's Stalin completed the process of imposing total controls on society. By and large, the policies he adopted at that time remained in effect until his death and established the framework of the existing Soviet regime.

The final stage in the consolidation of Stalin's power came with the purges of the 1930's, when terror was unleashed against party members for the first time. Many high- and middle-ranking officials of the government, party, army, and police, as well as prominent artists and scientists, either were executed or disappeared. The Old Bolsheviks, including any who in the past had challenged Stalin's claim to supreme power, as well as potential new challengers, were persecuted. Stalin emerged from the purges as the unchallengeable leader of the party, more than ever glorified by his followers as virtually a deity.

Although the very existence of the U.S.S.R. was gravely threatened by the Nazi attack in 1941, Stalin eventually succeeded in rallying the Soviet people to the defense of their homeland and drove the Germans back into Central Europe. After the war Stalin gradually became more and more isolated from the Soviet people and his associates. He tightened controls and initiated a new reign of terror. On the eve of his death in 1953, Soviet society—inefficient, stagnant, and ridden with fear and bureaucratic excesses—was gripped by potentially explosive discontent.

4. The Khrushchev era

In the months following Stalin's death, his closest associates drew together to prevent disunity and popular discontent from posing a threat to the regime and to themselves. The members of this "collective leadership" were not able to work together for long. Through skillful maneuvering and championing of bold and imaginative policies, Nikita Khrushchev gradually established his domination over the rest of the Presidium, and most of the members of the Stalinist inner group were driven from major positions of political authority. From mid-1957 until his ouster in October 1964 Khrushchev appeared to have increasingly made a fiction of the principle of collective leadership. It was, in fact, his increasingly willful brand of leadership that ultimately moved his lieutenants to act against him.

Khrushchev's rise to power was marked by important modifications of Stalinist policies. Perhaps most significant was the virtual elimination of terror. The secret police were reduced in number and subjected to close party supervision. Greater attention was devoted to consumer needs, and numerous innovations were introduced to make the economy and the government itself more efficient. Moreover, Khrushchev gave new impetus to Soviet foreign policy by increasing the emphasis on trade, foreign aid, and other means of fostering "peaceful coexistence" with nonsocialist countries.

Much of the vigor which Khrushchev's initiatives had imparted to the Soviet domestic scene and to the nation's role in the international arena began, however, to dissipate with the gradual accumulation of major policy failures. His preachment of "goulash communism" (communism with a liberal admixture of material gains), for example, aroused popular expectations which went beyond the regime's capacity to satisfy. In international Communist affairs he proved powerless to prevent, and he even exacerbated, the schism between the U.S.S.R. and Communist China and disarray within the Communist movement. The failure of his Cuban missile venture brought Soviet prestige to one of its lowest points.

Khrushchev reacted to these and other difficulties by relying increasingly on dictatorial methods in his relations with colleagues in the top party leadership. He inaugurated policy shifts without prior consultation and became steadily more arbitrary in his exercise of power. He began showing signs of age and spent more time away from Moscow, leaving state administration in the hands of the ambitious and powerful men who surrounded him.

5. The Brezhnev-Kosygin "collective leadership"

Khrushchev's overbearing style of leadership, therefore, became a foremost motive for his overthrow in October 1964 by a coalition of the colleagues he had affronted. Each leader undoubtedly had his own set of ambitions, personal grievances, and policy differences. During the first several months of the new regime, however, Khrushchev's successors revealed themselves to be committed to the main lines of post-Stalin Soviet policy, both domestic and foreign. They attempted to project an image of "scientific, businesslike" leadership in implied contrast to the "hare-brained schemes and adventurism" attributed to Khrushchev. It became clearer subsequently, however, that the new regime was merely biding its time and feeling its way toward major policies of its own.

The Brezhnev-Kosygin leadership in its first year of rule made serious attempts to come to grips with the needs of agriculture and the confused regional organization of industrial management and planning instituted by Khrushchev. Major allocations for agriculture were proposed publicly by party boss Leonid Brezhnev in March 1965, and an economic reform was undertaken in September under the aegis of Premier

Aleksey Kosygin. One of the first moves of the new regime had been to reunite the party structure which Khrushchev had divided into agricultural and industrial segments, and in mid-1965 the party leadership made another pitch for support from the aggrieved middle and upper echelons of party functionaries by tightening requirements for admission to the party and returning to the Stalinist concept of a "fortress party" of elite leaders.

Advocating some reinstatement of Stalinist policies, party dogmatists undertook a campaign of retrenchment, with apparent backing from Brezhnev, during late 1965 and early 1966 in preparation for the 23d Party Congress. Although public opposition and foreign Communist criticism seemed to have forestalled plans for a partial rehabilitation of Stalin in the regime's search for legitimacy and a return to more conservative policies at the 23d Congress (March-April 1966), the regime's more conservative representatives gradually succeeded in improving Stalin's place in history; moreover, some of the trappings of Stalinist institutions reappeared amidst signs of strain within the collective leadership.

The Soviet regime has not undertaken any major new programs since the 23d Party Congress, and its economic reform appears to have lost momentum at least in part as a result of the inertia of collective leadership. In foreign affairs the Soviet leadership weathered the June 1967 Arab-Israeli conflict despite reported internal party criticism of its military unpreparedness during the crisis. The armed intervention in Czechoslovakia in August 1968 also contributed to the regime's lackluster image. The policy decisions that have resulted from the shared-power relationship of collective rule have been unimaginative but orthodox; no single leader has displayed the combination of desire and political strength to upset the balance of power. At the same time, political maneuvering has continued behind the scenes.

B. Political dynamics

1. General

The Communist Party has been the key to the maintenance of the Soviet system; it wields supreme political authority in the U.S.S.R. Although the Soviet constitution simply alludes to the "leading" role of the party (Article 126), the party is in practice responsible for the formulation of all state policies and has ultimate control over their execution. Because of this, "politics" in the Soviet Union is largely political maneuvering and conspiracy among individuals high in the party's hierarchy. Public opinion scarcely exists as a political force and plays only a peripheral role at best. Organized political groupings either within or outside the party are forbidden, and even informal factionalism is sharply circumscribed in practice.

While presuming to be a "voluntary association" standing outside and above the formal institutions of government, the Communist Party actually creates the

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government and controls and directs its activity. This it does primarily through the assignment of party personnel to all important governmental posts. This relationship exists at all administrative levels and extends to all other vital institutions. The interlocking directorate at the highest party and government levels is shown in Figure 92. Figure 93 shows the relationship of party echelons to the several levels of the government.

The political forces that directly affect the internal balance of power have been dominated by the

Communist Party virtually since the Bolsheviks seized power in 1917. All other surviving parties were suppressed in 1921-22. Even during Stalin's reign of terror in the 1930's and late 1940's, when the instrumental role of the security police brought the party's primacy to its low point, it remained the only political party in the country. It provided the Stalin dictatorship with an appearance of legitimacy and continuity with Lenin's revolutionary state, as well as an ideological pretext for national expansionism. The

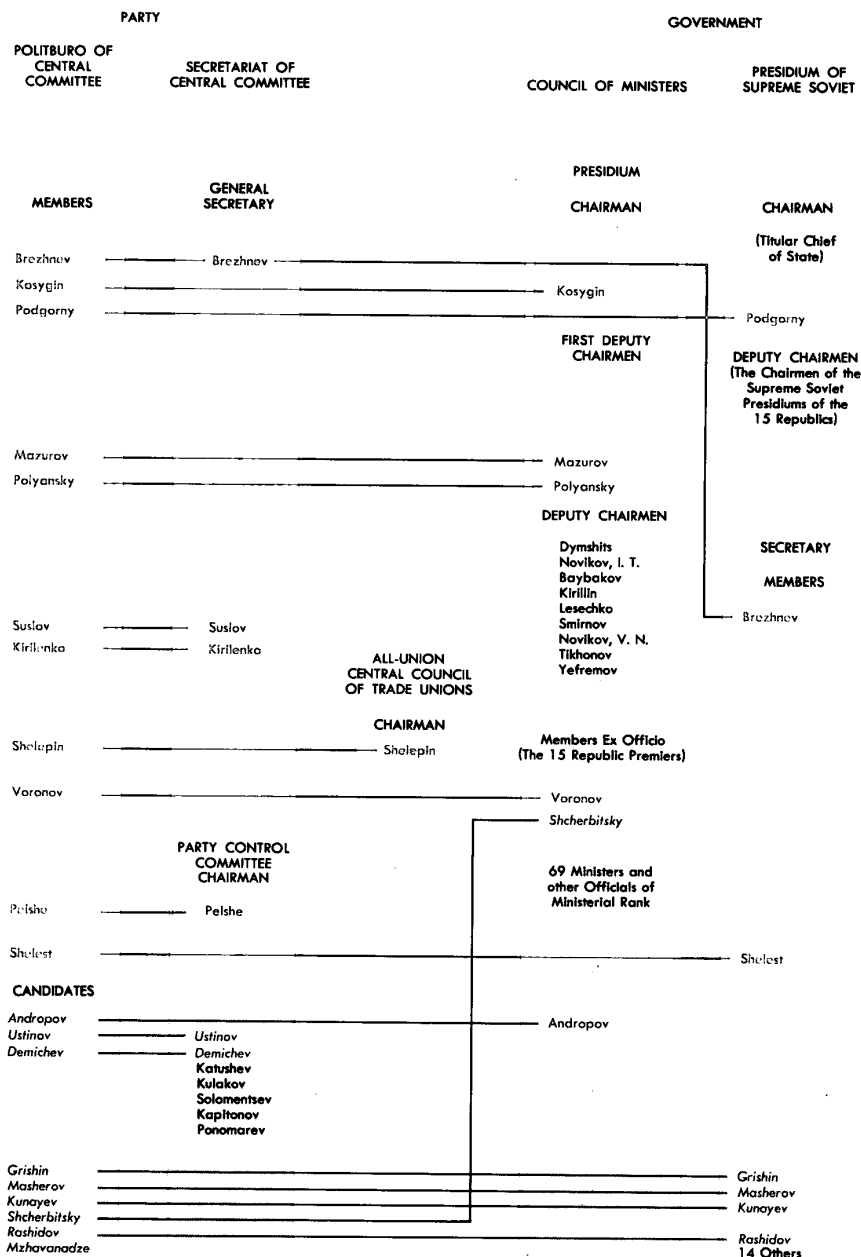


FIGURE 92. Interlocking directorate: party and government, August 1977

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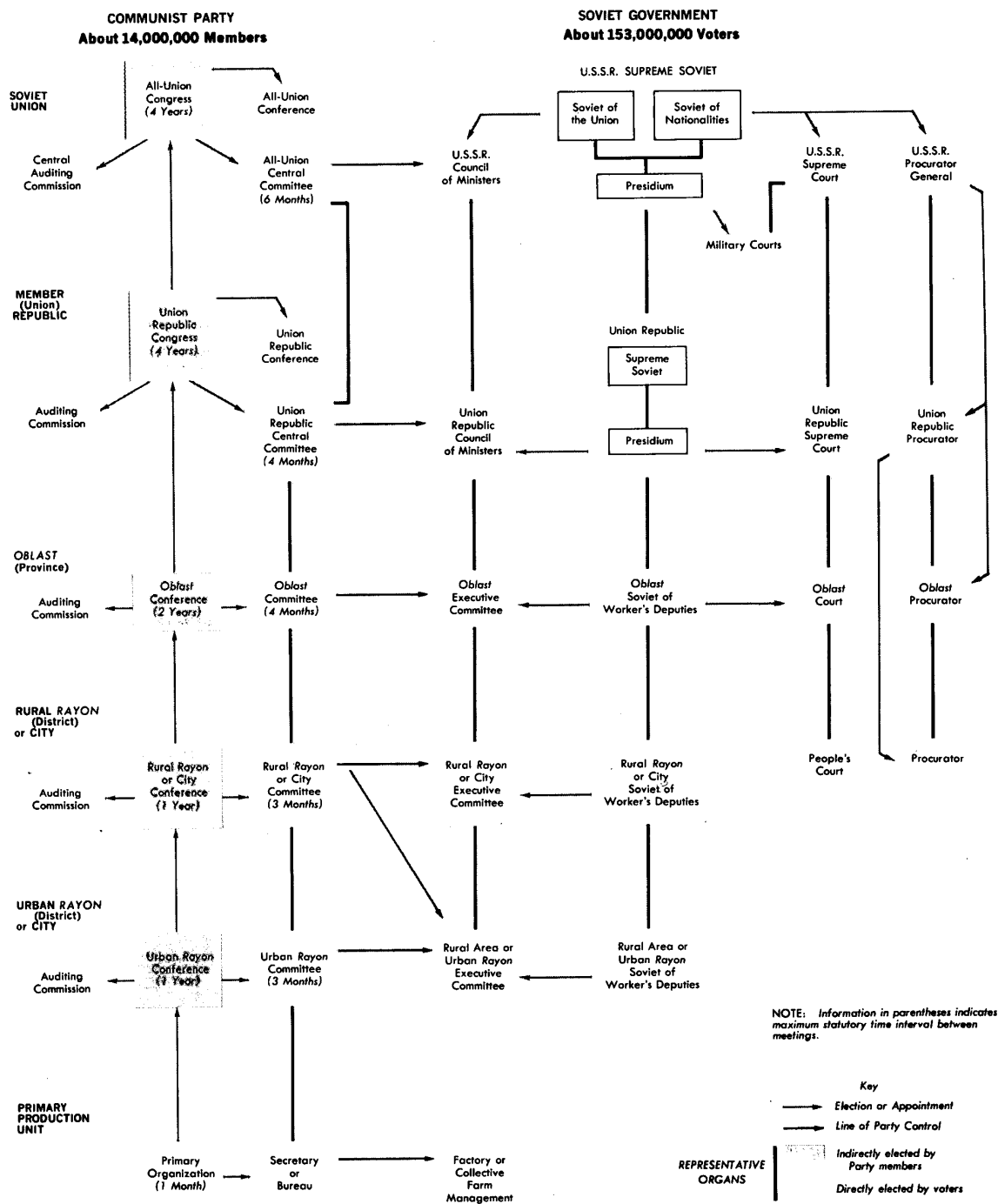


FIGURE 93. Party echelons and the Soviet Government, 1970

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security police and the armed forces, however, with their physical power and high degree of organization, were seen by the party leadership as a threat during the early post-Stalin years of "collective" rule. In 1953, Minister of Internal Affairs L.P. Beriia was executed as a "traitor" on a charge of attempting to seize power and to place the police above party and government; and in 1957, Minister of Defense G.K. Zhukov was removed from his party and military posts apparently for trying to free the armed forces from party interference. Since the removal of Beriia and Zhukov from power, the security police and the military have been effectively removed from direct involvement in the formulation of policy and have been placed under closer party supervision. Although they and other institutions still have considerable influence, none is capable of exercising independent political power outside the party.

The pervasive involvement of the Communist Party in all Soviet institutions gives great power and authority to its top leaders both collectively and individually. Ultimately the hard policy choices are made by the men at the top of the party. The most likely arena of meaningful political struggle is therefore within the party rather than between the party and special interest groups such as the military, the managerial elite, or industrial laborers, although these special interest groups may precipitate intraparty political struggles.

Nevertheless, the fragmentation of power inherent in the collegial nature of the post-Khrushchev leadership allows even greater room for political maneuvering among the individual party leaders, who tend to identify with and advocate the vested interests of institutions falling within their areas of competence. They use their influence to win favorable policy and budgetary decisions and to gain the appointment of proteges to key positions, especially within the party staff with its powerful voice in personnel policies. The party leaders appear to have been able to resolve most differences among themselves without engaging in a protracted and self-destructive power struggle, but they continue to strive for greater influence in policymaking and improved personal status and position.

2. Communist Party membership and organization

The membership of the Communist Party of the Soviet Union (CPSU) totaled over 14 million in April 1970, having grown from nearly 12.7 million as of January 1967, which was about 8% of the Soviet population old enough to join (18 and over). Figure 94, which shows the growth of the party since 1918, also indicates the close relationship that exists between the leadership's domestic and foreign policies and the growth of the party. The party's ethnic composition approximates that of the population as a whole, more than three-fourths of the total membership being Russian (roughly 61.8%) and Ukrainian (15.6%). Information on the social composition of the party is misleading, because Soviet statistics register social

status of individual members as the status prevailing at the time they joined the party. Officeworkers and others of the "intelligentsia," however, are believed to constitute a great, though declining, majority. Especially since 1958, the party has stressed preferential admission of industrial workers and farmers who are directly engaged in production. These groups constituted more than 60% of the new party candidates during 1956-66. As the ratio of the urban population increased in those years, so has the proportion of industrial workers, and in 1968 this group accounted for 52.4% of all new party candidates. Figure 95 shows the shifting social structure of new candidates from 1952 to 1966.

On the average, CPSU members of the present generation are slightly older and better educated but have had a briefer tenure in the party than those of 10 to 20 years ago. As of January 1967, 49.5% of the members were over 40 years of age, while in 1946 (due to replacement of purge victims in the 1930's and losses during World War II) 64% were in the 35-and-under age group. The proportion of party members with a secondary or higher education had risen from nearly 32% in 1947 and 38% in 1957 to about 51% by January 1967. The ratio of members with more than 10 years' tenure, rising from 34% of the total membership in October 1952 to 60% in October 1961, dropped to 41.7% by January 1967 as a result of a recruitment campaign vigorously pressed during 1958-65. A sizable and rapidly increasing proportion of party members now have had no party connection with the Stalin era and hence have little sense of personal involvement in Stalinist excesses. Figure 96 gives data on the length of membership in the party.

Although there are able people in the party, particularly at the top, it does not attract a membership uniform in caliber. Discipline is normally strict to suppress diversity of opinion within the organization, and in 1966 more than 80,000 members were expelled from the party for misdeeds or slackness. Although identified with the regime and generally regarded as members of a privileged class, party members have not incurred widespread dislike as individuals simply on the ground of their membership. Most Soviet people recognize that party status is a useful and, at higher levels, a necessary means of advancement. Membership at the lower levels does not necessarily imply total support of the regime or of its ideology, and many young members probably join in the hope of effecting reforms from within.

Closely associated with the party are the Communist youth organizations: the All-Union Leninist Communist Union of Youth, generally referred to as the Komsomol (ages 14-28), and the Pioneers (ages 10-15). Their total membership in May 1970 was over 44 million, about 27 million of whom were in the Komsomol. The Octobrists, children ages 7-9, are not formally organized, but their planned activity is considered as a preparatory stage for entry into the Pioneers. Communist youth, like members

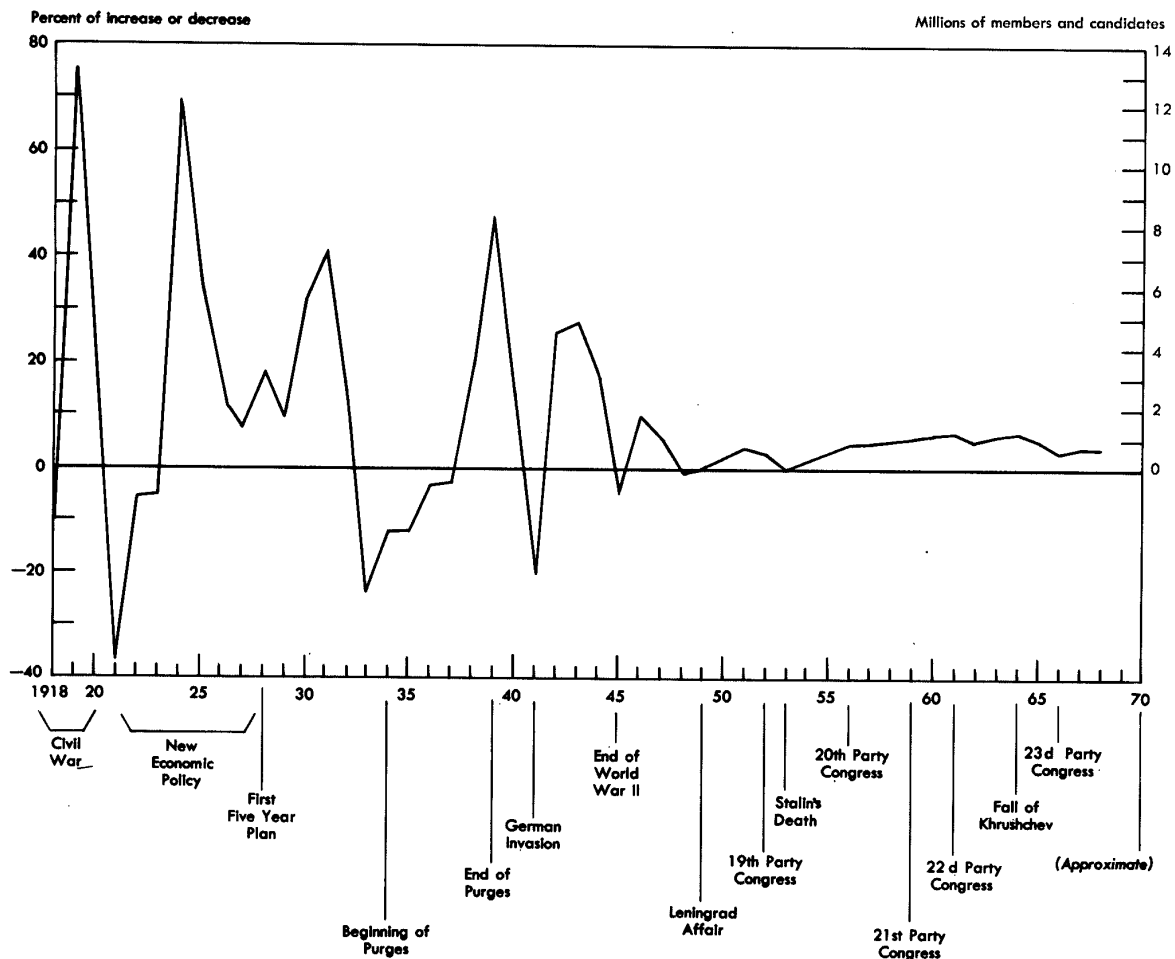


FIGURE 94. Growth of the Communist Party of the Soviet Union, 1918-70

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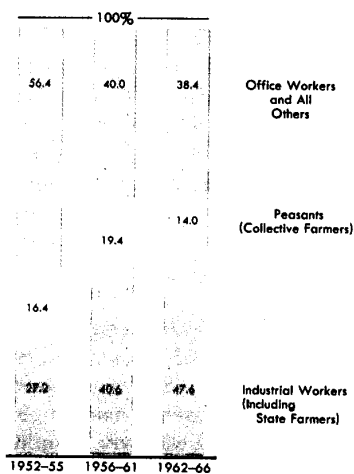


FIGURE 95. Social structure of the new party candidates, 1952-66 (U/OU)

of the party, are subject to intense indoctrination. On the whole, however, their role is an auxiliary one and their discipline not so strict.

The basic unit of the party is the primary organization, which is formed in factories, governmental agencies and institutions, farms, and units of the armed forces (Figure 93). Although the party statutes provide for the election of party officials, all officials require the approval of, and are often designated by, higher party authority. Each organization is answerable to the next higher unit in the hierarchy of party organizations. Party leaders make some attempts to encourage the initiative of rank-and-file members and the use of "criticism and self-criticism," but the most important function of party activity is the faithful execution of orders from above.

The All-Union Party Congress is nominally at the top of the party structure. The congress merely ratifies policies fixed by the Party Central Committee's Politburo (during 1952-66 called the Presidium). During Stalin's regime the congress was convened at irregular

FIGURE 96. LENGTH OF MEMBERSHIP IN THE COMMUNIST PARTY

25X1

YEARS IN PARTY*	DATES OF ADMISSION	NUMBER	PERCENT OF TOTAL MEMBERSHIP
As of 1 October 1952:			
10 or less.....	1942-52.....	4,542,216	66.0
11-25.....	1927-42.....	1,995,822	29.0
Over 25.....	1927 and earlier.....	344,107	5.0
Total.....		6,882,145	100.0
As of 1 January 1956:			
10 or less.....	1946-55.....	3,012,879	42.0
11-25.....	1931-45.....	3,658,496	51.0
Over 25.....	1930 and earlier.....	502,146	7.0
Total.....		7,173,521	100.0
As of 1 October 1961:			
10 or less.....	1951-61.....	3,886,402	40.0
11-25.....	1936-51.....	5,052,323	52.0
Over 25.....	1936 and earlier.....	777,280	8.0
Total.....		9,716,005	100.0
As of 1 January 1965:			
9 or less.....	1956-64.....	5,032,496	42.8
10-30.....	1935-55.....	6,031,941	51.3
Over 30.....	1934 and earlier.....	693,732	5.9
Total.....		11,758,169	100.0
As of 1 January 1967:			
10 or less.....	1957-66.....	6,126,435	48.3
11-30.....	1937-56.....	5,923,491	46.7
Over 30.....	1936 and earlier.....	634,207	5.0
Total.....		12,684,133	100.0

*Note changes in time period after 1961.

and increasingly lengthy intervals. Since Stalin's death in 1953 the party leaders generally have come closer to meeting the statutory requirement of holding a congress at least every 4 years. The 20th Party Congress took place in 1956, and the 21st "Special" Party Congress met in January 1959. The 22d Party Congress was held in October 1961, and the 23d, in March-April 1966. In July 1970 the 24th Party Congress was announced for March 1971.

The All-Union Party Central Committee and the Central Auditing Commission are next in the theoretical hierarchy. At the 23d Party Congress, when elections to these bodies were last held, 360 persons were named to the Central Committee (195 as full, or voting, members and 165 as candidate members), and 79 persons were named to the Auditing Commission (Figure 97). The Central Committee played a minimal political role during the latter part of the Stalin era, when it was convened only three times in over 10 years. Khrushchev called the Central Committee together far more frequently; from 1956 to 1964 the Central Committee averaged three sessions a year, each session averaging a little over 3 days in length. During 1965-67, Brezhnev convened the Central Committee about as often, but the sessions were briefer, averaging 1½ days in length. However, Khrushchev had used the device of "expanded" sessions, to which hundreds of nonmembers

were invited, in order to dilute the committee's authority and create a forum for propagating his own ideas while ignoring the dictates of collective decisionmaking. Brezhnev, on the other hand, has given the committee new prestige by restricting participation in the sessions to its members and allowing it a more meaningful advisory role than in the past. Only twice, however, has the Central Committee played a significant role in deciding the outcome of power struggles within the top leadership. In June 1957, unable to secure a majority in the Party Politburo (then the Presidium), Khrushchev outmaneuvered his opponents by referring the issue to a hastily called plenum of the Central Committee, which supported him against the so-called antiparty group in the Politburo. In October 1964, however, the tables were turned and a majority of the Central Committee, apparently disillusioned by Khrushchev's increasingly willful leadership and antagonized in particular by his reduction of their actual authority, endorsed the Politburo's decision to oust him. Aside from these two "times of decision," Central Committee members have primarily served the purpose of disseminating and implementing policy, and, as a body, have not significantly exercised their purported decisionmaking powers. Figure 98 compares the theoretical and actual channels of authority in the party.

The chief policymaking unit of the party is the Central Committee's Politburo, which in July 1970 consisted of 11 full and nine candidate members. A 10-member Secretariat is the party's chief executive body. Its main functions are described in the party statutes as the selection of personnel and checking the implementa-

tion of party decisions. The Party Control Committee, the least important of the Central Committee's auxiliary bodies, checks the observance of party discipline and morality and brings violators to account.

Party controls over central executive agencies are exercised through departments (*otdely*) of the Central Committee, which actually function as the staff (*apparat*) of the Secretariat (Figure 99). Each secretary, including General Secretary Brezhnev and the others having Politburo status, directs the work of one or more departments. Within the bounds set by top leaders, these departments work out the details of public policy.

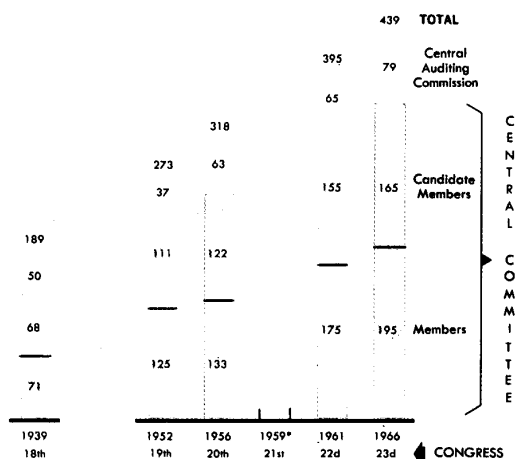
In general terms, the professional party staff performs the following functions:

- Disseminates, explains, and interprets party and state policy decisions.
- Implements party policies.
- Checks on and insures the implementation of state policy by governmental and other organs.
- Mobilizes economic and social pressures for the implementation of party and state policy.
- Allocates the manpower and resources of the party.
- Collects and evaluates information and prepares reports, memorandums, and staff studies for the Secretariat and Politburo.
- Calls the attention of the Secretariat and Politburo to problems and prepares, suggests, and recommends plans for their solution.

Similar staffs with comparable functions are organized under the secretariats of the republic party central committees. The Russian Soviet Federated Socialist Republic (R.S.F.S.R.), however, does not have its own republic party organization; traditionally, this

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FIGURE 97. Growth of the central party organs



THEORY

PRACTICE

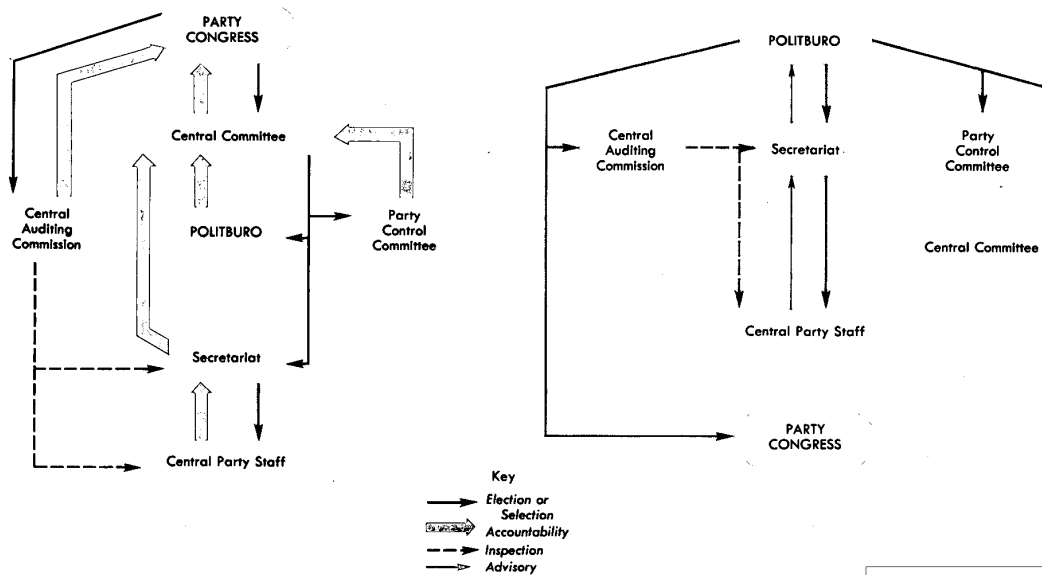


FIGURE 98. Theoretical and actual flow of authority in the Communist Party

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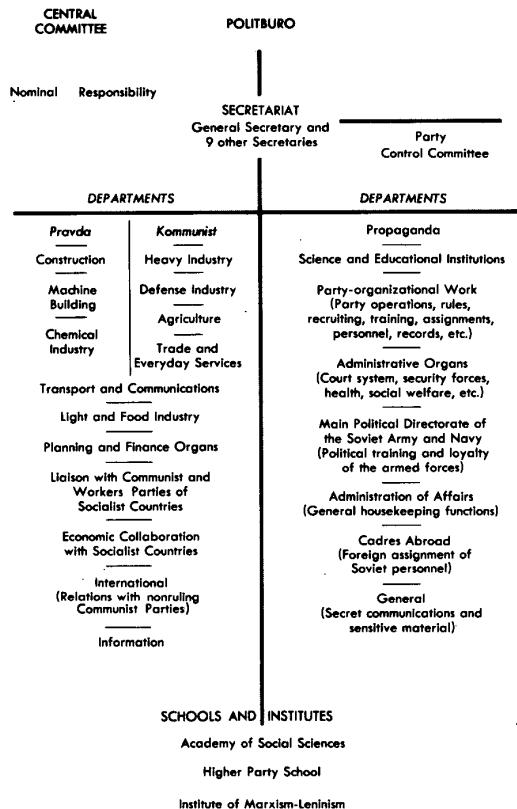


FIGURE 99. Central party machine

republic has been within the purview of the central party staff in Moscow. Prior to 1966, a Bureau for the R.S.F.S.R. existed under the Central Committee to perform these staff functions through departments similar to those on the national level; with the bureau's abolition by the 23d Party Congress in April 1966, the R.S.F.S.R. staff was assimilated into the central party departments.

Below the republic level, party control is exercised by provincial (*oblast*) and district (*rayon*) party committees and their bureaus and secretaries. They are assisted by departments similar to those assisting the republic party central committees, though of lesser scope.

Except for a brief period between late 1962 and late 1964, the party structure has been based on the geographical principle, with a party organization in each geographical unit responsible for almost everything that happens in its territory. In November 1962, however, Khrushchev introduced the "production principle" in structuring the party. With a few minor variations, the party was divided into two locally separate segments, one responsible for industrial (urban) areas and activities and the other for agricultural (rural) areas and activities, each with its

own secretariat and appropriate staff. This resulted in a multiplicity of overlapping party units, and the provincial party bosses, whose bailiwicks were thus divided, resented the cut in their authority. Since most of them were members of the Central Committee, their resentment undoubtedly played a large role in guaranteeing a majority vote against Khrushchev in October 1964. One of the first major policy acts of the new regime was the reversal in November 1964 of Khrushchev's bifurcation scheme, reaffirming the traditional geographical principle in structuring the party. The hierarchy of this system is shown in Figure 100.

A key element in the hierarchical system is the primary party organization, which is vested with control powers over the public institution where it is located. These "watchdog" organizations are responsible to higher party committees, not to the administrative chain of command of the institutions. Signals or warnings concerning activities in institutions in all spheres of public life are forwarded for action through the apparatus to the appropriate level of the hierarchy. At each level the party committees are assisted by a supervisory apparatus consisting of commissions and departments, which have the responsibility of checking all activities within individual sectors of public life, such as industry, agriculture, and so forth.

Party control implies maintaining an awareness of all activities and intervening as necessary to keep the system functioning as effectively as possible. Past Soviet statements on the meaning and limits of party control have lacked precise definition, particularly in the economic sphere. As a result, local party leaders have sometimes been chastised for interfering too much in management and, at other times, criticized for failing to exercise enough leadership. During Khrushchev's rule, party leaders were increasingly pressed to undertake economic training and to exercise greater authority in directing the economy. Under the post-Khrushchev "collective leadership," party and government responsibilities are more distinctly separate, and the party has deemphasized its program of economic training for party functionaries, once again giving priority to their political indoctrination. The present definition of party control tends toward restraint in interfering in management, and party organizations are instructed to "assist with advice and by example," not to supplant other organizations or take on their functions.

3. Top leadership

The dominant political figures in the U.S.S.R. are the members of the policymaking Politburo of the CPSU Central Committee. Figure 92 lists the members of the top leadership as of July 1970. At that time, there were 11 full (voting) and nine candidate (consultative) members of the Politburo. In the past, Politburo members have served simultaneously as both party officials and government administrators. Since

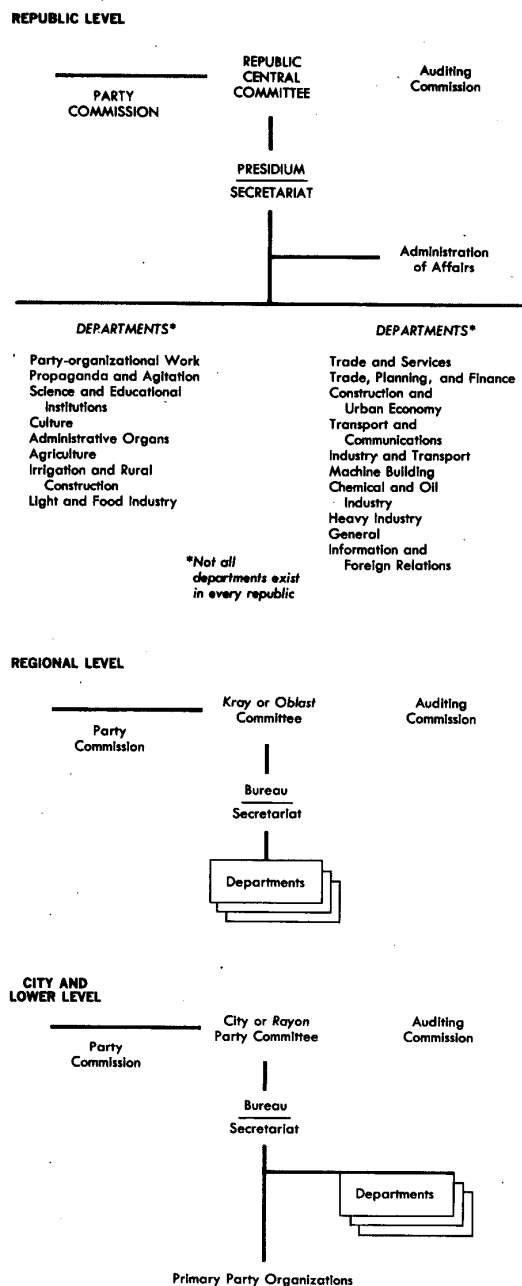


FIGURE 100. Republic, regional, and lower party structure

December 1965, however, they have served as one or the other, but not simultaneously. Of the full members, five served as party functionaries, five as government officials, and one in the trade union system. Of the candidate members, eight were party secretaries in the center or provinces, and only one served in the government. Two-thirds of the full members had served at least 5 years in that capacity. Figure 101 indicates seniority on the Politburo as of July 1970.

The power structure within the Politburo is similar to what it was in the last years of Khrushchev's rule. Figure 102 shows the changes in the Politburo from 1952 to 1968 and reveals tenuous lines of continuity from Stalin's time to the present. The composition of the group underwent several marked changes during Khrushchev's rise to power, but it has been relatively stable in the years of the Brezhnev-Kosygin regime. The disproportionate number of government officials on the Politburo in the early 1950's was reduced as Khrushchev accumulated strength in the Party Secretariat, and the present regime has maintained the predominance of full-time party functionaries that has characterized the body since the late 1950's.

There is no specifically designated "chairman" of the Politburo, and in theory its members carry equal weight in the decisionmaking process. As General Secretary, however, Leonid I. Brezhnev is the acknowledged leader of the ruling group and reportedly has the responsibility of convening and chairing Politburo sessions. Mikhail A. Suslov and Andrey P. Kirilenko, who are full members of the Politburo, appear to be the other most powerful party secretaries; candidate members Petr N. Demichev and Dmitry F. Ustinov have narrower secretarial responsibilities and appear to wield less actual power. Petr Ye. Shelest, another full member of the Politburo, is first secretary of the party in the Ukraine, while five candidate members are first secretaries of other republic party organizations. Additional party functionaries on the Politburo include full member Arvid Ya. Pelshe, chairman of the Party Control Committee, and candidate member Viktor V. Grishin, first secretary of the Moscow City Party Committee.

Members of the Politburo with primarily government functions include Aleksey N. Kosygin, as Chairman of the Council of Ministers (Premier), and Kirill T. Mazurov and Dmitry S. Polyansky, his first deputies. Another Politburo member, Nikolay V. Podgorny, is Chairman of the Presidium of the U.S.S.R. Supreme Soviet (titular chief of state). Of the other full members, Gennady I. Voronov is Chairman of the R.S.F.S.R. Council of Ministers, and Aleksandr N. Shelepin is Chairman of the All-Union Central Council of Trade Unions. Candidate member Yuri V. Andropov, whose tenure on the Politburo dates from his transfer in mid-1967 from the Party Secretariat to head the Committee of State Security, is the first secret police chief to be represented on the policymaking body, albeit in a nonvoting capacity, since the downfall of Beriya in 1953.

The Politburo is believed to meet at least once a week to consider questions of national policy. Its members have responsibility for initiating policy recommendations in areas within their competence as party or government executives. The overlapping of functions among individual leaders undoubtedly complicates the process of policy coordination and formulation, but primary responsibility in any sphere seems to lie with one specified leader. Thus responsibility in defense

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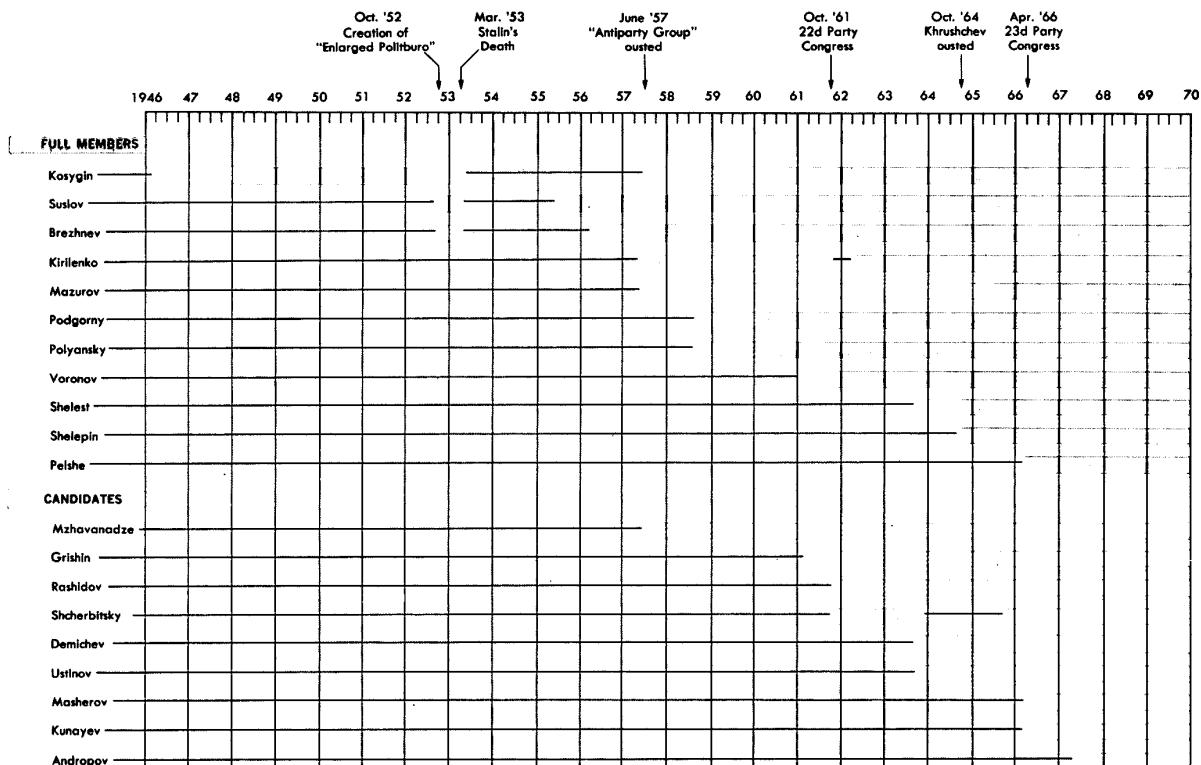


FIGURE 101. Seniority on the Party Politburo, August 1970

25X1

matters appears to rest with General Secretary Brezhnev; he is ex officio Chairman of the Defense Council, a civilian-military group which includes some other Politburo members and makes recommendations on defense policy in its broadest aspects for final decision by the Politburo.

Khrushchev once claimed that the Politburo members discussed policy recommendations until a common view was reached and that disagreements were resolved by a simple majority vote. It was clear during Khrushchev's rule, however, that he increasingly dominated the meetings of the Politburo and often made policy decisions independently or in conjunction with consultants of his own choosing, ignoring what in all probability was the majority view of his colleagues. Since coming to power in October 1964, Brezhnev has been unable to dominate the political scene as Khrushchev once did, and his position is one of preeminence rather than predominance. A restraint on his power is a ruling which the Central Committee adopted at the time of Khrushchev's overthrow, barring the party boss from simultaneously holding the government premiership. Aside from this check on the reestablishment of "one-man rule" (which in any case could be rescinded by the Central Committee at a plenum, should a political showdown occur), there are no known institutional safeguards regulating interplay within the Politburo.

Prior to his death in March 1953, Stalin had ruled as an absolute dictator, and his oracular voice in policy matters was law. His power had been achieved and maintained primarily through the secret police which was employed as an instrument of terror and intimidation; for years he either directed or connived at the physical liquidation of his more troublesome or ambitious subordinates and the frequent purging of the party as a means of assuring his complete dominance.

The men who inherited Stalin's mantle set out to rid the system of its worst faults, but in many ways they continued to function in the accustomed way, and the political scene during 1953 was in a state of flux. Georgy M. Malenkov had become head of both the party and the government when Stalin died, but 9 days later he was forced to relinquish his position as senior member of the Party Secretariat to Khrushchev. The ostensibly "collective" leadership was seriously divided, however, and political infighting was intense. Fearing the powers of Lavrenty P. Beriia, the chief of the secret police, the remaining members of the Politburo combined against him in June 1953, and he was executed as a "traitor" shortly thereafter. Beriia was the last high-level Soviet leader to be "coercively" eliminated by his political opposition.

Political maneuvering among the members of the Khrushchev-Malenkov "collective leadership" after Beriia's execution was revealed in the nonviolent terms

		OCTOBER 1952	MARCH 1953	FEBRUARY 1956	JUNE 1957	OCTOBER 1961	NOVEMBER 1964	APRIL 1966	JULY 1970
PARTY	SECRETARIAT	Stalin Aristov Khrushchev Malenkov Mikhaylov Ponomarenko Suslov Brezhnev Ignatov Pegov	Khrushchev	Khrushchev Suslov Brezhnev Furtseva Shepilov	Khrushchev Suslov Belyayev Aristov Brezhnev Furtseva Kuusinen Pospelov	Khrushchev Kozlov Kuusinen Suslov	Brezhnev Podgorny Shelepin Suslov Demichev	Brezhnev Suslov Shelepin Kirilenko Demichev Ustinov	Brezhnev Suslov Kirilenko Demichev Ustinov
	OTHER CENTRAL PARTY OFFICIALS	Shkiryatov		Shvernik	Shvernik	Shvernik Voronov	Kirilenko Shvernik Yefremov	Pelshe	Pelshe Grishin
	PROVINCIAL PARTY SECRETARIES	Andrianov Melnikov Patalichev Puzanov	Melnikov Bagirov	Kirichenko Mukhtidinov	Ignatov Kirichenko Kozlov Kalinberzin Kirilenko Mazurov Mukhtidinov Mzhavanadze	Podgorny Mazurov Mzhavanadze Rashidov	Shelest Mazurov Mzhavanadze Rashidov	Shelest Mzhavanadze Rashidov Shcherbitsky Masherov Kunayev	Shelest Mzhavanadze Rashidov Shcherbitsky Masherov Kunayev
GOVERNMENT	CENTRAL GOVERNMENT OFFICIALS	Stalin Shvernik Beriya Bulganin Ignatyev Kaganovich Malenkov Malyshev Mikoyan Molotov Pervukhin Ponomarenko Saburov Voroshilov Kabanov Kosygin Tevosyan Vyshinsky Zverev	Beriya Bulganin Kaganovich Malenkov Mikoyan Molotov Pervukhin Saburov Voroshilov Ponomarenko	Bulganin Voroshilov Kaganovich Mikoyan Molotov Pervukhin Saburov Malenkov Zhukov	Bulganin Voroshilov Mikoyan Zhukov Kosygin Pervukhin	Khrushchev Brezhnev Kosygin Mikoyan	Kosygin Mikoyan Polyansky Shelepin	Kosygin Podgorny Polyansky Mazurov	Kosygin Podgorny Polyansky Mazurov Andropov
	PROVINCIAL GOVERNMENT OFFICIALS	Korotchenko Kuusinen			Korotchenko	Polyansky Shcherbitsky	Voronov	Voronov	Voronov
	MISCELLANEOUS	Chesnokov Kuznetsov Mikhaylov Yudin	Shvernik			Grishin	Grishin	Grishin	Shelepin
	NUMBER OF PRESIDIUM MEMBERS	21 15	10 3	8 9	17 7	10 6	12 6	11 8	13 7

Stalin - Full Member, Politburo, Soviet Communist Party

Full-time Party Functionaries

Brezhnev - Candidate Member, Politburo, Soviet Communist Party

Full-time Government Functionaries

FIGURE 102. Evolution of the Party Politburo, 1952-70

25X1

of a struggle over policy issues. In September 1953 Khrushchev received the new title of First Secretary with its aura of Stalin's old title of General Secretary. He then defeated Malenkov in January 1955 after a contest over the issue of resource allocations: Khrushchev had argued successfully the orthodox view of the "primacy of heavy industry" against Malenkov's consumer-oriented program. Malenkov was replaced as head of the government by Nikolay A. Bulganin, essentially a front man for Khrushchev. Then

Khrushchev forced another old-guard leader, Vyacheslav M. Molotov, to confess to ideological errors in September 1955. The climax to the struggle came in June 1957, when a majority of the Politburo tried to oust Khrushchev. At a hurriedly convened plenum of the Central Committee, Khrushchev staked his career on his policy platform and won the approval of the plenum to continue it. In so doing, Khrushchev turned the tables on the opposition, achieving the complete ouster of Malenkov, Molotov, and Lazar M. Kaganovich, the so-

called antiparty group. Khrushchev further consolidated his position by removing several lesser opponents charged with supporting the group, and "collective leadership" ended in all but name when he took over the premiership from Bulganin in March 1958.

Regional associations or connections, which are an important factor in the political balance of the Brezhnev-Kosygin regime, also played a part in Khrushchev's rise to power. Charges that Malenkov, for example, had been deeply implicated in the infamous "Leningrad Affair," in which the city's party organization was decimated in 1949-50, contributed to his downfall. Two current leaders survived the "Leningrad Affair." Party Secretary Suslov still carries a stigma due to his public denunciation of the economic "heresies" of N. A. Voznesensky, who was executed at the time of the purge. On the other hand, Premier Kosygin, a Leningrader and Politburo member at the time of the affair, in the post-Khrushchev years championed economic reform largely based on the theories of Voznesensky. But Khrushchev's main political gains were the result of the appointment to key positions of proteges who had worked with him in the Ukrainian party organization. Three full members of the present Politburo—Brezhnev, Kirilenko, and Podgorny—had served in the Ukraine under Khrushchev and were brought into the ruling body by him in the late 1950's. A fourth—Polyansky, whose ties to Khrushchev are somewhat more tenuous—was brought into the Presidium in 1960. These four leaders form the nucleus of a loosely knit Ukrainian group whose interests coincide on some, though not all, issues.

The fortunes of the Ukrainians under Khrushchev's aegis reflected their gradual ascendancy over rivals from the Leningrad and Moscow party organizations, traditionally the most important geographical bases of power in the Soviet system. Brezhnev's influence in the 1950's as a Politburo member and a Party Secretary grew considerably after the defeat of the "antiparty group" but was suddenly deflated in 1960 when he was appointed to the largely ceremonial post of chief of state and, as a result, removed from the Party Secretariat. The beneficiary of this transfer was the Leningrader Frol R. Kozlov, who emerged at the 22d Party Congress in October 1961 as second-ranking man in the Secretariat and Khrushchev's heir apparent. Moreover, Brezhnev's Ukrainian associate, Kirilenko, was dropped as a candidate member of the Politburo, and a Kozlov protege from Leningrad, Ivan V. Spiridonov, was added to the Party Secretariat. The Leningraders' ascendancy did not last long, however. Spiridonov was transferred from the Secretariat 6 months later to a relatively unimportant position in the Supreme Soviet and at the same time Kirilenko was returned to the Politburo, this time as a full member. In November 1962, four new party secretaries were added to dilute Kozlov's influence; two of them were Ukrainians, none Leningraders. When a stroke in April 1963 effectively removed Kozlov from the political scene, Kosygin was the only remaining Leningrader in the top echelons of the party. The pendulum swung back toward the Ukrainians 2 months later, when Brezhnev, retaining

his state post, was again added to the Party Secretariat, together with Podgorny. By July 1964, when he relinquished the post of chief of state to Anastas I. Mikoyan, Brezhnev had become Khrushchev's actual second in command, with Podgorny the only potentially serious contender.

It was, nevertheless, a coalition of the Ukrainian, Leningrad, and Moscow party leaders that overthrew Khrushchev in October 1964. The coup was engineered by Brezhnev and his Ukrainian cohorts, with the assistance or ultimate acquiescence of the entire Politburo. They apparently received important support from Party Secretary Aleksandr N. Shelepin, whose protege Vladimir Ye. Semichastny (himself a product of the Ukrainian party organization) headed the secret police. The Central Committee plenum, approving the action of the Politburo majority against Khrushchev, divided his dual position between Brezhnev as party boss and Kosygin as government chief (Premier). One month later Shelepin was made a full member of the Politburo, bypassing the candidate stage, clearly as a payoff for services rendered.

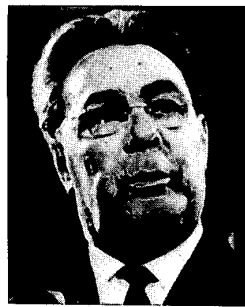
Shelepin's entry into the highest policymaking echelon, however, marked the beginning of a new phase in Soviet politics, the influx of a "Young Turk" element into the leadership. After a brief shakedown period, when the new regime appeared to function relatively smoothly as a genuine collective, Brezhnev began to assert his authority as party boss, primarily at the expense of Shelepin. By October 1965, less than a year after Khrushchev's ouster, Brezhnev had all of his mentor's positions except that of Premier. He had not only become party chief, but was also chairman of the now-defunct Bureau for the R.S.F.S.R., member of the Presidium of the U.S.S.R. Supreme Soviet, chairman of the commission to draft a new constitution for the U.S.S.R., and head of the country's Defense Council. Capitalizing on his recognized authority, Brezhnev moved to neutralize the "Young Turk" Shelepin and to consolidate the position of older, conservative elements within the party hierarchy. In December 1965 Brezhnev announced the abolition of the Party-State Control Committee that had been headed by Shelepin, who was released as a deputy premier and transferred to full-time work in the Party Secretariat. Mikoyan, who had been a close adviser to Khrushchev and champion of the cause of liberal economists and intellectuals, "retired" and was replaced by Podgorny. The latter's departure from the Secretariat reduced the number of secretaries who were full members of the Politburo to three—Brezhnev, Suslov, and Shelepin—all of whom were thus well-placed 3 months later to influence the proceedings of the 23d Party Congress, including the selection of delegates and the "election" of a new Central Committee. Thus, although Shelepin had been deprived of his government posts, a real increase in his party authority left him a serious rival to Brezhnev.

Brezhnev's preeminent position, however, was enhanced by actions taken at the Party Congress in March-April 1966. He acquired the title General Secretary, held previously by Stalin, in place of Khrushchev's title, First Secretary. Kirilenko was added

to the Party Secretariat, increasing the Ukrainians' strength in it at the expense primarily of senior secretaries Suslov and Shelepin. Moreover, Brezhnev further diminished Shelepin's influence by relieving him of his important secretarial responsibilities in party-organizational work and assigning him the relatively innocuous function of overseeing light industry and consumer-goods production. Finally, Brezhnev more than any other leader succeeded in placing associates on the newly elected Central Committee.

After the 23d Congress, the "collective leadership," led by an inner circle comprised of Brezhnev, Kosygin, Podgorny, and Suslov, continued to function with few outward signs of serious disagreement over the direction of Soviet policy. Brezhnev, however, maintained the political struggle against Shelepin and the "Young Turk" element, primarily concentrating on securing control of the key institutional power bases in the fields of security, the military, and propaganda. In September a long-time Brezhnev associate, Nikolay A. Shchelokov, was appointed to run the newly centralized militia ministry over the head of the leading candidate, former militia chief and Shelepin protege Vadim S. Tikunov. The Ukrainians succeeded, despite indications of some opposition, in attaining the appointment of their candidate, Andrey A. Grechko, as Minister of Defense in April 1967, replacing the deceased Malinovsky. One month later, Shelepin's long-time associate Semichastny was removed as security police chief and shunted aside to the position of first deputy premier in the Ukraine. His replacement by Party Secretary Yuri Andropov, who was subsequently released from the Secretariat but promoted to candidate member of the Politburo, had the effect of making the security police accountable in greater measures to the collective leadership. In June, an outspoken "Young Turk," Nikolay G. Yegorychev, was replaced as Moscow City party boss by trade union chief Viktor V. Grishin, a party leader in the Brezhnev mold. Shelepin was shifted from the Party Secretariat in July to the nominally important post of head of the trade unions, although he retained his place on the Politburo. The transfer of several other Shelepin associates from key propaganda posts during 1967 and again in 1970 further insured the senior leaders against serious encroachments by their juniors.

Although Brezhnev has strengthened his position vis-a-vis Shelepin with apparent support from other senior members of the leadership, the exercise of his power is checked by the constraints of "collegiality" and, specifically, by the requirements of his shared-power relationship with Premier Kosygin. Both leaders have so far acted as though they recognize the value of maintaining the separateness of their functions and doing the job each is best suited to by virtue of his past experience and training. However, the party boss and the Premier bring differing attitudes toward common problems of general policy, partly because of their contrasting personalities and partly because of the requirements of their posts, and these differences produce occasional frictions.

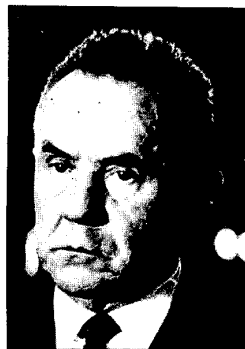


Leonid Illich Brezhnev

1970

25X1

General Secretary Brezhnev, a Russian, was born in December 1906 in the Ukrainian region of Dnepropetrovsk. Schooled in land management and metallurgical engineering, he held various government and party positions in the Ukraine during the 1930's and 1940's, serving during World War II as a political officer with Khrushchev on the southern front. After leaving the Ukraine in 1950, Brezhnev had a distinguished career in such varied jobs as party chief in Moldavia, political boss of the Soviet Navy, and Khrushchev's viceroy in Kazakhstan during the launching of the "new lands" program. In February 1956 he began a first tour in the central Party Secretariat, overseeing industry, construction, and probably security affairs. After serving as titular chief of state during 1960-63, he returned to the Party Secretariat where he gave every indication of being a loyal supporter of Khrushchev prior to the ouster in October 1964. Although Brezhnev appears to be an effective administrator, he does not reveal great imagination as a policy originator nor does he have his predecessor's flair for dynamic and innovative leadership. He is, rather, a traditionalist whose basically orthodox, middle-of-the-road approach to problems has stood him in good stead with the more conservative segments of society—the party dogmatists, the military and police, the heavy industrial establishment, and reactionary writers—while tending to alienate those reform-minded elements willing to stretch Communist doctrine and entertain certain unorthodox departures in policy.



Aleksey Nikolayevich Kosygin

1969

25X1

Premier Kosygin who at 66 is roughly 3 years older than Brezhnev, was born and educated in Leningrad. He worked for several years in trade agencies in Siberia

before attending the Leningrad Textile Institute, from which he was graduated in 1935. He served briefly as mayor of Leningrad before being called to Moscow in 1939 as the chief minister of the textile industry. In subsequent years he held various high-ranking positions in the fields of light industry and trade, then in 1956 he began a 4-year stint in various top planning posts. In May 1960 he was elevated from his chairmanship of the State Planning Commission to become one of the two first deputy premiers and Khrushchev's senior economic specialist in the government. Like Brezhnev, Kosygin gave every appearance of being in general agreement with Khrushchev's policies. Because Kosygin's practical experience has been almost exclusively in economic administration, he has neither the experience in party-organizational work nor the manifest ambition to become a candidate for the top party post. He has shown himself to be an eminently pragmatic and capable administrator, with a superior grasp of the manifold aspects of problems that come under his purview. An earnest man of deep convictions, Kosygin seems to have a very strong attachment to his native land and in particular to Leningrad, whose devastation under German attack during World War II reportedly had a profound effect on him and may have been a significant factor behind his apparent predilection for seeking general détente in foreign policy.



Mikhail Andreyevich Suslov

25X1

1967

Senior Party Secretary, Suslov (67), the regime's top theoretician, has primary responsibility for Soviet party relations with the world's Communist parties. He has served continuously since 1947 on the central Party Secretariat. He has seniority over Brezhnev and Kosygin in both continuous and total years' experience as a voting member of the Politburo. Although Suslov lacks the levers of power attached to the post of General Secretary, his doctrinaire views exert a strong conservative influence on Soviet policies. His staying power derives at least in part from his apparent aloofness in the give-and-take of day-to-day party politics and evident lack of interest in assuming the top party post.



Nikolay Viktorovich Podgorny

1970

Titular chief of state, Podgorny served many years in the Ukrainian party organization; a protege of Khrushchev, he was first secretary of the republic party from 1957 until he became a central party secretary in 1963. He lost ground politically in mid-1965 when his home base in the Ukraine was harshly attacked, apparently at Brezhnev's instigation. Since his transfer in December 1965 to his present state post, Podgorny has served primarily as a regime spokesman and has displayed little initiative or influence in promoting new lines of policy. His age (67) and reported poor health militate against his assuming more arduous leadership tasks in the future.



Andrey Pavlovich Kirilenko

25X11

1968

Senior Party Secretary Kirilenko, although something of a "faceless" party functionary, is a long-time associate of Brezhnev and one of the most powerful men in the top leadership. He has a background as an industrial expert and is primarily the *de facto* party boss of the largest Soviet republic, the R.S.F.S.R. His tenure on the Party Secretariat dates from the abolition in April 1966 of the Bureau for the R.S.F.S.R., on which he was first deputy to Khrushchev and, subsequently, to Brezhnev. He became a full member of the Politburo in April 1962, after a brief interruption of his career that coincided with a political setback suffered by Brezhnev. His few public statements suggest that, despite his

closeness to Brezhnev, Kirilenko may be willing to give greater play to pragmatic administration of state affairs. He is 63 years old.

plus, at 52, his relative youth, are valuable assets to his manifest ambition for higher position. However, these are offset somewhat by his rather narrow specialization in agricultural administration and by chronic health problems.



Kirill Trofimovich Mazurov

1967

First Deputy Premier Mazurov has primary responsibility for economic administration, concentrating on industrial questions. He has been a full member of the Politburo since his appointment as Kosygin's first deputy in March 1965; party boss in Belorussia for almost 10 years, he apparently was checked in his advance to the highest party echelon by Khrushchev, with whom he had public disagreements on questions of agricultural administration. He maintains significant influence on agricultural policy, particularly regarding increased rural construction; in many instances his views appear to conflict with those represented by Polyansky. His age is 56.



Gennady Ivanovich Voronov

1967

R.S.F.S.R. Premier Voronov held a variety of party and government posts in the R.S.F.S.R. before succeeding Polyansky as R.S.F.S.R. premier in November 1962. Like Polyansky, Voronov during the 1960's specialized in agricultural matters. He was elevated rapidly to the policymaking level of the Politburo in 1961, when the fortunes of the Khrushchev clique were at a low point, and he has appeared to have been politically neutralized subsequent to their reascendancy the following year. Voronov's occasional public statements reveal him as a pragmatic administrator in the Kosygin mold. He is 59 years old.



Dmitry Stepanovich Polyansky

1970

First Deputy Premier Polyansky has been a deputy premier with special responsibility for agriculture for roughly 6 years, the last 3 as first deputy. A full member of the Party Politburo since May 1960, he had risen rapidly through a series of party and government posts in the Ukraine and the R.S.F.S.R. which culminated in the premiership of the Russian Republic; he held the latter position during 1958-62. His close political ties with the other leaders who have risen through the Ukrainian party—Brezhnev, Podgorny, and Kirilenko—



Aleksandr Nikolayevich Shelepin

1970

Chairman of the Trade Union Council, Shelepin, the "Young Turk" of the Kremlin hierarchy, has suffered a political eclipse since 1965. His post traditionally has offered little in the way of political leverage. For 15 years (1943-58) Shelepin was a central Komsomol secretary with great if not determinative influence in personnel matters; the power base he built there now comprises a significant force at the junior level of party functionaries. His term from 1958 to 1961 as security police chief also provided him with important support, and his promotion to the central Party Secretariat in October 1961 and additional assignment as a deputy

25X1

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25X1

premier 1 year later made him one of the most powerful men in the Kremlin. Although he now retains full membership in the Politburo (attained in November 1964), Shelepin lost all party and government executive positions after an apparent bid in 1965 for the top party post occupied by Brezhnev. An outspoken militant in foreign policy matters and advocate of stringent economy in government, Shelepin, who is 57, still has significant support among younger party leaders and could overcome the present slump in his authority as they move into positions of greater power.



Petr Yefimovich Shelest

1968

Ukrainian Party First Secretary Shelest has made a career almost exclusively in the Ukrainian party organization, becoming party boss there in July 1963. He was promoted to full membership in the Party Politburo in November 1964, but, being based in Kiyev, his influence within the top leadership is probably somewhat limited. Shelest appears to have risen to prominence under Khrushchev's aegis as a counterweight to Podgorny, as well as to Brezhnev's protege Shcherbitskiy in the Ukraine. Whereas Podgorny has favored priority development of light industry and agriculture, Shelest has emerged unequivocally as a spokesman for the heavy industrial interests to which Brezhnev has deferred. His age is 62.



Arvid Yanovich Pelshe

1967

Chairman of the Party Control Committee Pelshe, who is 71 and an Old Bolshevik, was coopted into the Party Politburo in April 1966 while serving as a

replacement as head of the control agency for the retired Nikolay Shvernik. Prior to his transfer to Moscow he had served for 25 years as party secretary—the final 7 years as party chief—in Latvia. He had distinguished himself in the republic as a faithful servant of the regime, especially in suppressing nationalist tendencies. Pelshe's present post theoretically gives him great independent powers, but in fact he probably answers directly to Brezhnev. Pelshe has tenuous career ties with Suslov, who reportedly is his brother-in-law.

C. Structure and functioning of the government

1. General

25X1

The Soviet constitution gives a faulty and misleading picture of the system it purports to establish or describe. The first two constitutions, those of 1918 and 1924, did not even mention the source of supreme political authority in the country—the Communist Party. The constitution now in force, promulgated in 1959, mentions the party in a single reference, declaring that the CPSU, composed of "the most active and politically conscious citizens, is the leading core of all organizations of the working people, both public and state." The constitutional statement that "all power in the U.S.S.R. belongs to the working people of town and country as represented by the soviets of working people's deputies," in fact, means as represented by the party. Similarly, the constitution lists a number of "fundamental rights and duties" that purportedly insure civil rights—including freedom of speech, the press, assembly, and demonstrations—provisions which have served as models for other Communist constitutions. These rights, however, are qualified as "guaranteed by law," so that the enabling regulations can and do limit such personal expression to whatever is judged by the party to be appropriate. Again, this "Stalin constitution," as it is still referred to unofficially, outlines a federal union in which individual republics are given the right to secede, although the U.S.S.R. is actually a highly centralized state and most of the republics were incorporated into the union and kept in it, by force.

One of the chief functions of the constitution is to serve as a propaganda weapon, both at home and abroad; it is used by Soviet propagandists to perpetuate the fiction that the U.S.S.R. is an advanced democracy. The idea that the constitution as a legal document should limit the operations and powers of government is foreign to Soviet communism, since it implies restraints on the will of the party. In application, the constitution serves to limit the rights and powers of the people, not of the government, and to emphasize the duties of citizens to the Soviet Government. The concept of unconstitutionality, therefore, has no practical meaning in terms of the system's operation.

The constitution is notable for the frequency and ease with which it is amended, although the changes normally apply to minor details of governmental

structure not found in most other constitutions. The only difference between ordinary lawmaking and constitutional amendment in the U.S.S.R. is that the latter requires the approval of two-thirds of the members rather than a simple majority in the Supreme Soviet. The requirement is of no significance, however, since the Supreme Soviet invariably approves unanimously whatever legislation is set before it.

The party rulers for several years have indicated an intention to introduce fundamental changes in the constitution. Obvious procrastination on the project, however, suggests that meaningful discussion and revision of the document are considered a political Pandora's box which is better left unopened. Nikita Khrushchev first broached the idea of a new constitution in 1959 at the 21st Party Congress. Responsibility for preparing basic provisions was assigned subsequently to the Institute of Law of the U.S.S.R. Academy of Sciences. In April 1962 the U.S.S.R. Supreme Soviet created a commission to draft the new constitution and elected Khrushchev its chairman. The work of the commission went unpublicized until July 1964, when its subcommissions made reports and were instructed to continue their work. Leonid Brezhnev officially replaced Khrushchev as chairman of the commission in December 1964, and a year and a half later he declared that the new constitution would "crown" the 50th anniversary of the Soviet regime in November 1967. However, no revised constitution appeared and the propaganda fare for Constitution Day (5 December) in 1967 and in subsequent years has been considerably muted. Regime spokesmen have occasionally referred to a new constitution since that time but no new deadlines for its appearance have been set. The vague statements about the projected constitution thus far relate primarily to the doctrinal points and statements of goals and give little reason to expect significant changes in the system.

The governmental system of the U.S.S.R. includes legislative bodies, executive agencies, and courts. The Soviet regime explicitly rejects, however, any theory of the separation of powers. The Supreme Soviet and also the lower soviets are not merely legislative assemblies but bodies combining all types of governmental functions. The constitution nowhere describes the soviets as legislatures or parliaments, although they are the only bodies constitutionally qualified to enact "laws" (*zakony*). This provision is observed formally. Many of the edicts (*ukazy*) issued by the Presidium of the Supreme Soviet and decrees (*postanovleniye*) issued by the Council of Ministers, however, deal with matters as significant as those treated in laws and must also be obeyed throughout the U.S.S.R. The Presidium of the Supreme Soviet is authorized by the constitution to annul decrees and regulations of the Council of Ministers if they are not in accord with the law, but this authority has never been exercised. Instead, the "law" has been changed to comply with the provisions of the decrees.

The Government of the U.S.S.R. is the most important of the many agencies by which policies determined by the Communist Party are carried into effect. Soviet sources are explicit on the point that the party is primary and the government secondary, that the party has the initiative and the government the role of execution. Little initiative in important matters is left to government officials (particularly those lacking party positions of authority). Moreover, the government is so extensive and the level of training compared with that of the West so low that actual administrative efficiency leaves much to be desired. Party influence may be transmitted directly to the heads of governmental agencies, thence vertically through the lower echelons of the agencies, or it may pass vertically through the party structure and laterally to the several levels of the nonparty structure. Most often, both channels are in operation simultaneously. The hierarchical relationship of the party and government structures is shown in Figure 93.

Party control of governmental agencies is simplified by the presence of party officials in key positions at all levels of government; the higher one ascends, the closer the connection becomes. The relationship at the highest party and government levels is shown in Figure 92.

2. Central government

25X1

The constitutional position of the branches of the Soviet Government contrasts markedly with their real position. The constitution designates the Supreme Soviet as the highest organ of power, its Presidium as an ancillary body subordinate to it, and the Council of Ministers as an appointed instrument subordinate to both. In reality, however, the order of importance of the three bodies is roughly reversed. It is not that constitutional provisions are violated—in general they are rigidly adhered to in form—but that the constitution suggests only vaguely the actual moving forces behind the government. The Supreme Soviet, for example, a bicameral body consisting of the Soviet of the Union and the Soviet of Nationalities, is actually of no real importance as a lawmaking agency. Normally the Supreme Soviet meets about twice a year for a few days each time and passes unanimously the budget and other laws placed before it. Each chamber of the Supreme Soviet has standing commissions with statutory authority to exercise some legislative initiative and to supervise the work of the government's executive agencies. The October 1967 regulation on the commissions, however, does not spell out their powers sufficiently to make a reality of the Supreme Soviet's constitutional prerogatives in these matters. Data on the Supreme Soviet are shown in Figure 103.

The Presidium of the Supreme Soviet is of somewhat greater importance. It directs and coordinates the activities of the standing commissions and otherwise conducts business between sessions of the Supreme Soviet. Certain powers are conferred on the Presidium alone, such as the issuance of edicts, ratification and denunciation of treaties, appointment and removal of

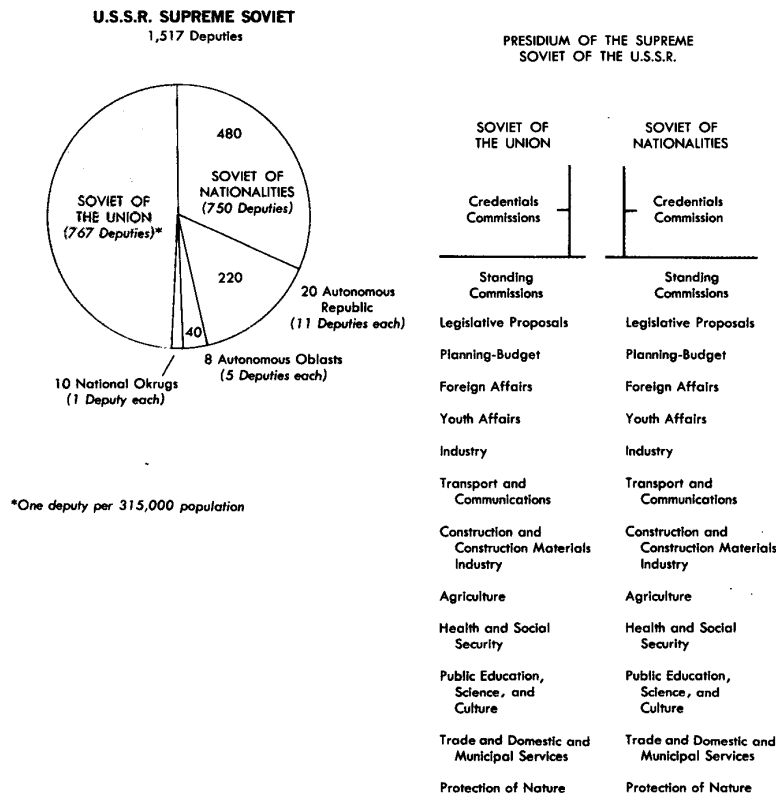


FIGURE 103. Representation and structure, U.S.S.R. Supreme Soviet, August 1970

25X1

the command staff of the armed forces, and declaration of war or mobilization. These acts are not subject to later ratification by the Supreme Soviet. The significance of even the Presidium, however, stems not from its constitutional position but from the presence in it of persons of indisputable political power achieved through activities in other more important jobs. In 1970 the Presidium consisted of a chairman, 15 deputy chairmen (one from each of the union republics), a secretary, and 20 other members.

The Presidium of the Supreme Soviet officially represents the Soviet state. Its chairman receives the credentials of foreign diplomatic representatives, greets visiting delegations from foreign governments, and affixes his signature to certain international agreements. A member of the Party Politburo (Nikolay V. Podgorny in 1970) fills this position. The incumbent usually has been considered titular chief of state. When Khrushchev visited the United States in the autumn of 1959, however, the Soviet Government insisted that he was doing so in the capacity of chief of state. Even though he was not even a member of the Presidium of the Supreme Soviet at that time, he was awarded full chief-of-state honors on his arrival in Washington. Brezhnev was elected a member of the Presidium of the Supreme Soviet one year after replacing Khrushchev as party head, but he seldom acts in his state capacity.

The Council of Ministers is the most important agency in the governmental structure. Its 81 members (as of mid-1970) include a chairman, deputy chairmen, ministers, and other leading government officials. The structure of the council is shown in Figure 104. In addition, the chairmen of the 15 republic councils of ministers are ex officio associates. In mid-1970 Aleksey N. Kosygin was chairman, and Kirill T. Mazurov and Dmitry S. Polyansky, also members of the Party Politburo, were first deputy chairmen. The nine other deputy chairmen did not hold such high party rank.

In theory, decisions are made by the council meeting as a whole; in fact, the council meets irregularly, and decisions are usually made by the Presidium of the Council of Ministers, a little-publicized "inner cabinet" which includes the chairman, the first deputy chairmen, all deputy chairmen, and probably, in most sessions, the Minister of Finance, with the heads of appropriate ministries or other bodies participating as consultants. The Presidium of the Council of Ministers, which meets at least once a week, may from time to time delegate responsibility to *ad hoc* commissions it creates for special purposes. It is supported also by permanent commissions which coordinate administration on a broad, supraministerial level in certain areas of the economy; each of these commissions probably is headed by a deputy premier.

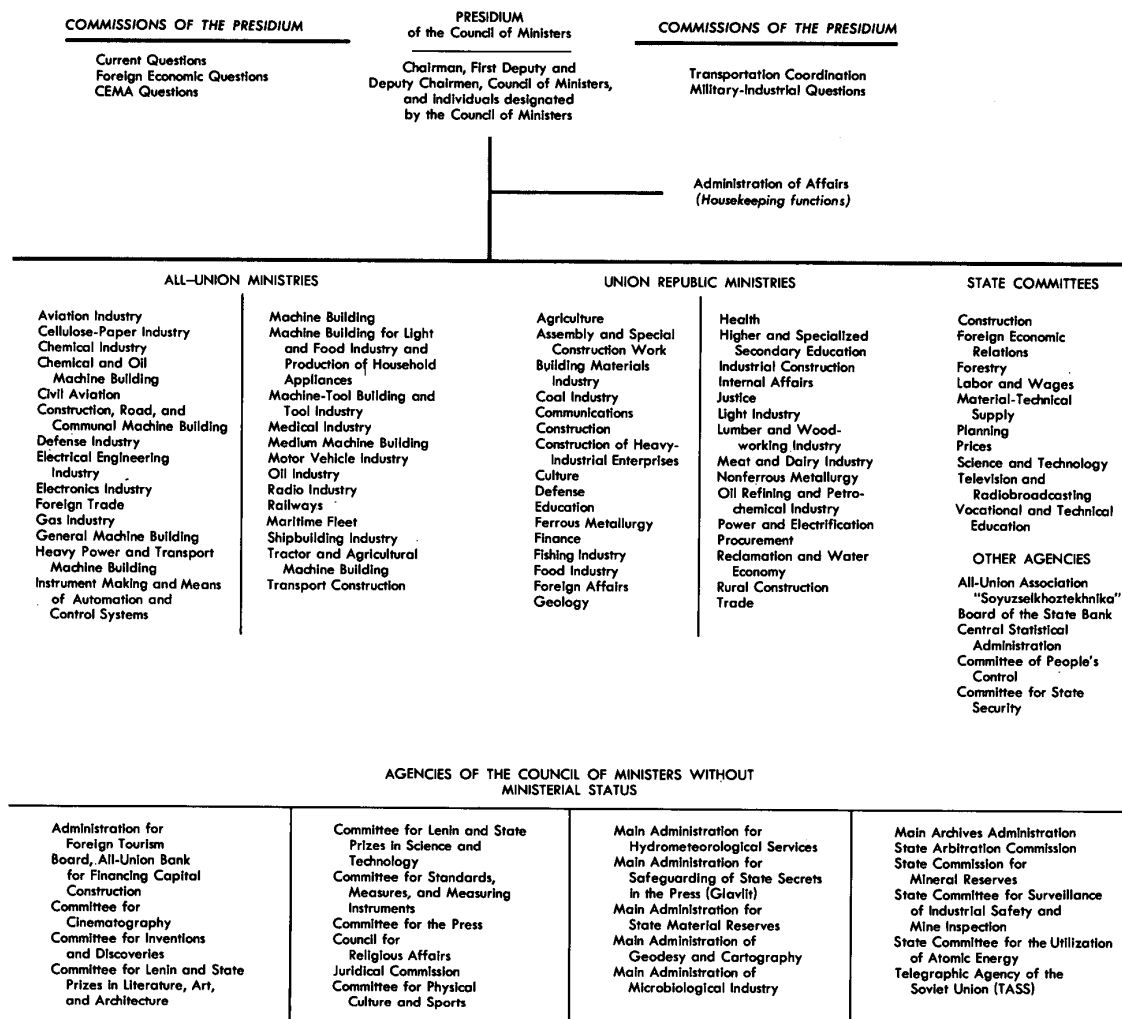


FIGURE 104. U.S.S.R. Council of Ministers, October 1970

25X1

Under Stalin and for some time after his death, most industrial and other economic enterprises were subordinate to ministries in Moscow. "All-Union" ministries administered affairs in the republics through direct representatives appointed by national agencies; affairs of the central "Union Republic" ministries were administered in the republics through counterpart ministries staffed by men formally appointed by the individual republic governments with the concurrence of the central ministry and responsible both to the republic council of ministers and to the central ministry.

The industrial ministries were abolished in a reorganization of industrial management beginning in 1957. Most of the former ministries were converted into state committees, whose chairmen continued as members of the Council of Ministers. These state committees performed planning, research, develop-

ment, and certain other functions considered best performed centrally. The managerial functions formerly vested in the ministries were transferred to regional councils of national economy (*sovnarkhozy*) which administered most of the economic life of the country according to the state plan. These councils at first were subordinate to the republic council of ministers, but later modification of the system led to some dual subordination, primarily to a U.S.S.R. *sovnarkhoz* which coordinated *sovnarkhoz* activities on a national level.

The post-Khrushchev regime has recreated the ministerial system much as it had existed prior to 1957. Seven ministries involving the major defense and defense-related industries were reestablished in March 1965, and the entire *sovnarkhoz* system was completely abolished the following October, with industrial state

committees being replaced by ministries. By mid-1970 there were 58 central ministries—including 27 “All-Union” and 31 “Union Republic”—compared with 52 at the time of Stalin’s death.⁷

3. Lower governmental structure

The chief administrative units below the national level are the republic, the *oblast*, and the *rayon*. Most of the republics include at least one preponderant ethnic group and a number of lesser minorities. The larger and more socially developed an ethnic group, the higher the governing unit that serves it. The Russian Soviet Federated Socialist Republic (R.S.F.S.R.), as the largest republic, is the nucleus of the nation. It is twice as large in area as the other 14 republics combined and has 53.8% of the total U.S.S.R. population. The other republics are encouraged to look upon it as a prototype.

The republics have their own constitutions, supreme soviets (unicameral), and councils of ministers, and have otherwise been invested with some of the trappings of sovereign states. The powers listed in Article 14 of the Soviet constitution as being exclusively within the competence of the central government are, however, so sweeping that the actual autonomy of the republic governments is severely circumscribed. The scope of the activity of republic ministers, including those concerned only with local matters and lacking counterparts at the U.S.S.R. level, is determined by the plans drawn up by the central government, by the national budget implementing them, and by decrees of the All-Union Party Central Committee and the U.S.S.R. Council of Ministers. All republic ministries are likewise subject to party control by the republic central committee, exercised through the party organization within governmental bodies and by direct intervention.

The principal political administrative unit below the republic is the *oblast* (region). *Oblasts* in the R.S.F.S.R. are roughly comparable to a state in the United States. The components of the *oblast* governments, though bearing different names, correspond to those on higher levels. Their soviets are analogous to the supreme soviets, and the executive committees elected by them correspond in function to the councils of ministers. The *Kray* is an administrative-territorial unit, which exists only in the R.S.F.S.R.; a *Kray* usually contains one or more *oblasts*.

Ethnic minorities have been settled, in most cases, in distinct administrative territories, the so-called autonomous republics and autonomous *oblasts* and the national *okrugs* (regions), (Summary Map, Administrative Divisions inset, Figure 187). The governments in these territories, which are located for the most part in the R.S.F.S.R., are similar in form to those of the parent republic but enjoy far less power; the constitution of an autonomous republic, for example, must be confirmed

⁷For a current listing of key government officials consult *Chiefs of State and Cabinet Members of Foreign Governments*, published monthly by the Directorate of Intelligence, Central Intelligence Agency.

by the supreme soviet of the parent republic. In actuality, therefore, the minority groups have no real opportunity for autonomous self-government.

Below the level of the *oblast* is the *rayon*, which is generally analogous to a U.S. county (urban *rayons* correspond to the boroughs or wards of large U.S. cities). The *rayon* is the lowest level at which the subordinate agencies of the ministerial structure are found and the level with which the citizen most often deals.

4. Judicial system (U/OU)

Soviet courts, according to the constitution of 1936, are to be “independent and subject only to the law.” However, Soviet theory on the administration of justice requires also that the court serve an educative function and holds that the concept of the apolitical judge belongs to “bourgeois mythology.”

The Soviet judicial system is also distinguished by the quasi-judicial powers which the police have enjoyed. Before 1953 most political cases were handled by the security police without reaching the courts at all. There have been subsequent efforts to regularize prosecution and to restrict the security police, and greater attention is paid to juridical forms. However, the security police, with party support, sometimes flout provisions of the law.

The organization with the broadest authority in the Soviet judicial system is the Office of the U.S.S.R. Procurator General. Since 1936, this office and its investigative apparatus have been independent of all other judicial organs. As redefined in a 1955 statute, the powers of this agency extend to virtually all organizations and persons in the U.S.S.R., and its agents are not subject to any local authority. The agency has two functions: 1) supervision over the administration of justice, and 2) general supervisory authority designed to insure conformity with the law by all organs of government. In carrying out the first of these functions, a procurator is responsible for the investigation, prosecution, and appeal of cases which violate the criminal code; he may sometimes intervene in cases concerning violations of the civil code.

The Procurator General exercises complete control over the procurators below him. He names the republic and *oblast* procurators; the republic procurators appoint the *rayon* procurators with the approval of the Procurator General. The Supreme Soviet of the U.S.S.R. appoints the Procurator General, who serves a 7-year term; all the other procurators serve 5-year terms.

Supervision of court decisions rests ultimately with the U.S.S.R. Supreme Court and the U.S.S.R. Procurator General. The Supreme Court serves as the final court of appeal for lower courts, both general and special. Supervision and training of court personnel and general administration of the court system—but without the legal right to interfere directly in any court case—was formerly the responsibility of the republic ministries of justice. These ministries were abolished during 1956-63, and other organs (usually the republic supreme court) assumed their functions. However, in August

1970 the Presidium of the Supreme Soviet reestablished the Ministry of Justice at the union republic level, suggesting that similar ministries will be established in the various republics.⁸

After the death of Stalin the Soviet legal system underwent a series of reforms which culminated in a major revision of the principles of criminal law and procedure in December 1958. These principles, as revised, provided the basis for new legal codes in each union republic. They now contained a number of liberalizing provisions. For example, courts alone were to decide guilt and to sentence a prisoner, and the position of the accused was strengthened. The burden for proving guilt was placed on the procurator. On the other hand, the presumption of innocence is still not clearly embodied either in law or in practice. Despite liberalizations, certain crimes are still loosely defined, the accused has no right to counsel during the period of investigation—which can last up to 9 months while the accused sits in prison. An example of the serious abuse that remains possible was the detention of four dissidents for 1 year before being brought to trial in January 1968.

Some cases of antisocial behavior not involving criminal liability are decided in the republics by so-called comrades courts. These assemblies of Soviet citizens "rehabilitate" the defendant by exposing him to the public censure of his peers. After public discussion of the case, the court reaches a decision by a "vote" taken among its chairman and his assistants, usually two or three lay assessors. These lay judges of the comrades courts, whose decisions are not subject to appeal to the regular Soviet courts by the defendant, can impose a variety of minor punishments. The role of the comrades courts has declined considerably from the high point it had reached in the late 1950's. However, the involvement of these and other extrajudicial institutions in administering justice—for example, local executive committees which have the authority to assign persons avoiding "socially useful labor" to work in a local enterprise—continues to detract from the modest gains in judicial reform since Stalin's death.

5. Electoral procedures

Since 1936 the right to vote has been conferred on a very large proportion of the Soviet population, without the discrimination against social origins formerly in effect and without regard to race, nationality, sex, or religion. In addition, direct popular elections were extended from the lowest echelon in the Soviet governmental structure—the rural and urban soviets—to all governmental levels. Long before 1936, however, elections had ceased to be a medium for expressing popular opinion and had become a propaganda device for conveying the impression of solidarity between the people and the regime.

⁸The decree establishing the ministry did not clearly delineate the powers and responsibilities of the new ministry, making it virtually impossible to assess its effect on the supervisory function of the procuracy and the Supreme Court or what the relations of these two organs to the ministry will be.

The party and government devote a great deal of attention to getting out the vote, and consequently the percentage of the electorate who vote has always been large. In the 1970 Supreme Soviet elections, for example, 99.96% of the 153,237,112 registered voters were reported to have participated. The deficiencies of the suffrage in the U.S.S.R. do not arise from discrimination or inequalities but from the lack of meaning of the ballot. No meaningful choice is given the voter because only one person is permitted to run for each office, and the voter may simply approve or disapprove his candidacy. All candidates for public office are officially described as candidates of the "bloc of Communists and nonparty persons."

On the surface, the nomination system used in Soviet election appears to involve some public participation, but in reality the candidate is picked in advance by local or higher party officials and approved by the appropriate unit in the executive staff of the party in Moscow. The nominating procedure, as an analysis of the Soviet press reveals, is as follows: the voters in each public organization, plant, or other institution in a constituency meet to nominate a candidate, and then the representatives of these groups of voters meet again to discuss and settle upon a candidate whom all will support. Almost invariably the various organizations have nominated the same person. Where there are several nominees, all except one are leading party workers who are "honored" with nominations in many constituencies. Since no one can "run" in more than one constituency, the "honorary" nominations must be declined, leaving only the one approved candidate with a place on the ballot.

Provision is made for secret voting, but the act of entering a booth marks the voter as a person of doubtful loyalty, since his presumed purpose is to vote against the candidate by scratching through the name.

D. National policie

Underpinning all national policy objectives of the Soviet Union has been a consistent determination on the part of the nation's leaders to insure the preeminent authority of the Communist Party and the unquestioning implementation of its decisions at all levels of government. The successful pursuit of this aim, together with the effective restrictions on public dissent, has given the various programs of national policy, both domestic and foreign, a measure of unity and cohesiveness.

The Soviet leaders' preoccupation with power originated in the circumstances under which the Communist Party seized control of the Russian state in 1917. Although a small minority, the Communists came to power determined that they alone must rule and that a new political, social, and economic order would be established throughout the world in accordance with their ideological conceptions. In pursuit of these goals, the party used terror as an instrument of rule. This course, which was elevated by Joseph Stalin to a national policy, for many years alienated important

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segments of the population and generated within the party leadership itself strong feelings of insecurity. Retaining many of the prominent features of the rigid dictatorial system which Stalin had developed, but also aware of its shortcomings, the leadership under Khrushchev sought to rationalize it and to increase popular support. The post-Khrushchev regime has given evidence of a similar objective. It has not been averse, however, to tightening some domestic controls in an effort to ward off the potential threat inherent in Khrushchev's unfettering of tendencies toward democratization.

1. Domestic

After the abolition of all remaining opposition parties in the early 1920's, one-party rule became an indispensable foundation of the Soviet state. All aspects of national life have been subordinated to the political aims of the ruling group. These aims are stated and explained in terms of "Marxism-Leninism," the only officially approved political philosophy in the U.S.S.R.

Under Stalin, the U.S.S.R. embarked in the late 1920's on comprehensive and ruthlessly enforced programs of industrialization and agricultural collectivization, which are still the cornerstones of the Soviet system. Virtually all means of production were placed in the hands of the state, and all economic planning of any consequence was centered in Moscow. For several decades, successive production plans, normally of 5 years' duration, have determined economic activities. Heavy industry and defense-related production have expanded at a rapid rate, while agricultural production and living standards have made more moderate gains. Trade unions became and have continued to serve as mere instruments of the party, which determines all labor policies. Private farming, except for small household plots of land, has not existed since the peasants were forced to join collective farms in the campaign which began in 1929. Private retail trade, except for the collective farm markets and, occasionally, experimentation in small-scale vending, was abolished and the citizenry still buys most consumer goods from state stores.

The post-Stalin leadership devoted its efforts to rationalizing the economy and increasing productivity. Although continuing to give priority to heavy industry and defense, it began to pay more attention to the improvement of living conditions. The Brezhnev-Kosygin regime, in particular, has sought practical solutions to redress the imbalance in economic priorities and to improve administrative performance. One of its first economic decisions allowed for significant increases in allocations to agriculture. In September 1965 a broad program of reform of industrial management and planning provided for a considerable measure of decentralization in economic decisionmaking within the traditional framework of centralized direction. Renewed emphasis has been placed on scientific and technological progress; minimum wages have been raised; more consumer goods, including TV sets and

major household appliances, have been made available; the construction of new housing, though still grossly inadequate, has been accelerated; and an effort has been made to refine the use of material incentives. As a result of these various developments, the economy has become better balanced, living conditions have improved, and popular grievances are less acute. By U.S. and even West European standards, however, the lot of the consumer remains drab—per capita consumption is still less than one-third that of the United States—but the material level of living by Soviet standards is tolerable.

To carry out its policies, the ruling group has long relied on an elaborate system of controls over the whole range of social activity. The surveillance of the security forces of the Committee for State Security (KGB) and of the ministries for the civil police is pervasive, extending throughout Soviet society.

Security controls and restrictions on the population were developed progressively under Stalin and were especially severe during World War II. After the war most of the wartime measures were left in force and, beginning in 1946, were supplemented by a series of new coercive statutes. Labor discipline, the control of movement, and restrictions on freedom of speech thus reached an alltime peak in the postwar period. Following Stalin's death arbitrary police action was gradually restricted and some of the extreme measures were relaxed or annulled. The legal basis for criminal prosecution was narrowed and penalties softened. Criminal procedure also was revised to strengthen the position of the accused, and the number of political prisoners was sharply reduced. Although in 1961-62 this liberal trend was partially reversed by the institution of increased penalties for some crimes, the Soviet regime seems to have moved gradually toward a closer balance between repression and persuasion.

All communications media are controlled by the state and function primarily in order to insure that the dissemination of information is kept within limits acceptable to the party. Strict controls on the work of Soviet intellectuals were reintroduced with unprecedented rapidity following a period of relative relaxation during the war. A new period of comparative freedom began after Stalin's death, but the Hungarian revolt in 1956 brought an end to this thaw. However, as a result of alternating periods of relaxed and tightened discipline, the arts and sciences have won some measure of freedom from political control. The limits on this freedom, nevertheless, remain narrow, and the Brezhnev-Kosygin regime has taken new steps—primarily in the form of political trials and psychiatric detention—to restrain or silence the increasingly vociferous dissidents among the intellectual community.

The Soviet leaders since Stalin's death have tended to place increasing emphasis on the use of economic incentives, while still giving an important place to exhortation and moral suasion; in addition to the traditional promotion of campaigns and competitions for honorary titles, the regime has sanctioned an

increase in the kinds of material rewards available particularly to managers and specialists. Expressing concern over social stratification, the regime has taken measures to make the peasant a more respected and better rewarded member of society. Reforms in education have included the introduction of courses in industrial and agricultural arts in the general schools, and the children of poorer parents are being given financial assistance to continue their education, if only on a part-time basis.

The party continues to propagate atheism and seeks to eliminate religious beliefs through propaganda and harassment, including the closing of churches. Nevertheless, many churches remain open and in use, and Jewish prayer books, the Bible, and the Koran have been printed in limited editions. Many measures designed to protect the family as an institution and offset the libertarian practices of the early days of the Soviet regime are still in effect. Some of Stalin's stricter measures have, however, been modified; divorce is somewhat easier to arrange, and abortions have been legalized once again.

Departing from a restrictive policy established under Stalin, the Soviet Government has since the early 1960's permitted and even fostered the expansion of contacts with the outside world. Western delegations and tourists have been visiting the Soviet Union in large numbers, although their itineraries and contacts with Soviet citizens are closely controlled. The number of Soviet specialists traveling to foreign countries on official visits has increased, and small groups of Soviet tourists, considered reliable by the regime, have been permitted to travel abroad. In recent years, Soviet authorities have also shown an increased willingness to issue exit visas to permit the reunion of families and allow Soviet citizens to visit relatives in the United States. The number of such visas, however, still remains rather small. Although censorship continues to be pervasive in Soviet information media, jamming of Western radio programs has, on the whole, been reduced and access to Western literature somewhat improved, and the Soviet press has been giving a broader and slightly less distorted view of the world outside.

2. Foreign

a. GENERAL—Soviet foreign policy is compounded of Communist ideology, Russian national interests, and the requirements imposed by internal conditions in the U.S.S.R. The ideology underlies much of the expansionist character of Soviet foreign policy, assuming as it does the inevitable and continual growth of Communist power at the expense of the non-Communist world. When the demands of revolutionary Communist doctrine conflict with the interests of the Soviet state, however, the problem is almost always resolved in favor of the latter and rationalized as preserving the "bastion of communism." The internal factors affecting foreign policy may vary somewhat with time as they do in Western countries. Typically,

however, the Soviet leaders show a strong compulsion to weigh a policy in terms of its effect on their ideological and power monopoly.

The line between a Soviet policy which satisfies ideology and that which serves strictly national interests is often indistinguishable. The extensive Soviet land grabs in Eastern Europe during and just after World War II filled both needs but could have occurred just as well under the tsars. The attempts to expand the areas of Communist control in more distant places, such as Africa and Asia, fall more readily into the realm of ideological endeavor. Here too, however, Soviet national interests have a direct bearing on the ideological position assumed by Moscow. Support for a war of national liberation, for example, can risk a challenge from the United States, and the Soviets have this much in mind when deciding how far they wish to involve themselves.

The finer points of ideology came into play most clearly in the U.S.S.R.'s relations with other Communist states. Disputes over aid to national liberation movements, how to deal with "bourgeois" nationalist leaders, what is the correct road to socialism, independence within the "Communist camp," and numerous other contentious issues have led to divergencies in the world Communist movement. Communist states are increasingly twisting the concepts of Marxism-Leninism to suit the ambitions of their leaders and the particular demands of their societies. The U.S.S.R., which has come to have a larger stake in the *status quo*, is bound to interpret the Communist ideology with considerably less revolutionary fervor than China or Cuba. The U.S.S.R. has seen obvious advantages to itself in trying to maintain a unified world Communist movement, but most smaller, less powerful countries, such as Yugoslavia and Romania, feel that their role in such a situation can be only a restricted, subservient one. The ideological split in the movement has also affected Moscow's dealings with the nonruling Communist parties. Though an overwhelming majority of parties remain responsive to Soviet advice or direction, Moscow has had to loosen its grip and in some cases has lost control completely.

An exaggerated concern with national security has traditionally characterized Russian policy, and this has been true of the Soviet regime. Protection of the homeland is the decisive reason why Soviet leaders have given first priority to trying to retain tight control over the states of Eastern Europe where Soviet policy is centered on the problem of dealing with West Germany. Similarly, with the intensification of the Sino-Soviet dispute and the resultant possibility of a major Russian-Chinese clash, the Soviets have been turning more and more of their attention to strengthening defenses in the area bordering China.

The priority attention given to Eastern Europe and China is, of course, a function of geography. Geography also gave rise to the now well-worn phrase "warm-water ports," to which the growth and activities of the Soviet Mediterranean squadron, starting the last half of 1967,

lent new currency. There are other and perhaps sufficient reasons to account for the acute interest the Soviets have shown in the strategic lands of the Mediterranean littoral since the late 1950's, but year-round access to the oceans of the world is at least a subsidiary goal of Soviet foreign policy in the area.

Some of the internal factors which, along with Communist ideology and Russian national interests, shape Soviet foreign policy are obscured by the secrecy that surrounds so many of the Soviet regime's actions. The Soviets have sometimes as a consequence of an internal power struggle given the world an insight into the decisionmaking process in Moscow, when the winners and losers are then identified *ex post facto* with correct and incorrect policies. The general lack of open discussion when policy is actually being made, however, inhibits outside analysis of the factors which influence decisions. Nevertheless, it is clear enough that the preoccupation of the Soviet leaders with preserving their supremacy in party and government is, more than in most countries, a powerful determinant. This often works to the U.S.S.R.'s disadvantage, hindering as it does the adoption of flexible foreign policies, especially toward the non-Communist world. It places restrictions on the influx of ideas and information, especially the kind which would test or bring into question any aspect of the Soviet system. There has been a gradual but erratic and carefully limited loosening of these restrictions as the U.S.S.R. has come to accept the need for beneficial exchanges with other nations, particularly those which can help advance Soviet technology and science. Nevertheless, the continuing restrictions on the free flow of ideas of a political nature, from the outside or domestically generated, continue to rob Soviet policymakers of an important ingredient of effective statecraft.

Stalin's successors in 1953 saw that his militant, uncompromising policies had tended to unite the West, isolate the U.S.S.R., and lessen Soviet prestige and influence. They have been less rigid and doctrinaire, more practical, and, indeed, more realistic. It was not until the 20th Party Congress—the scene of Khrushchev's "secret speech"—in 1956, however, that the change from Stalinism was formally enunciated and given the necessary theoretical underpinning.

b. SOVIET POLICY TOWARD THE LESS-DEVELOPED WORLD—Stalin's successors undertook a concerted economic and political offensive in the less-developed countries of Africa and Asia designed to supplant the influence of the West and, as much as possible, to align those countries with the U.S.S.R. Military aid, starting with the first large arms deal with Egypt in 1955, has proved to be Moscow's most effective instrument. Economic aid has been used more sparingly. Soviet economic resources are constantly strained by domestic demands, and the U.S.S.R. has generally avoided making the kind of commitment in these areas that might saddle it with the additional burden of underwriting the economies of struggling and often unstable countries.

A dynamic aspect of post-Stalin foreign policy has been this effort to identify the U.S.S.R. with the aspirations of the developing countries and to gain dominance over nationalist, anticolonialist movements and governments. Stalin had generally regarded the "bourgeois" leaders of the Afro-Asian countries as members of the enemy camp. His successors decided to work with them wherever possible, hoping at least to insure their neutrality and to help limit or lessen Western influence. In fact, when forced to choose between supporting the local Communists or an anti-Communist, neutralist, or anti-Western group in power, the U.S.S.R. has often sacrificed the Communists.

In resorting to conventional diplomacy in much of the less-developed world, the U.S.S.R. has often varied its tactics according to the nature of the individual country's ties with the West. To neutrals, the U.S.S.R. offers generous terms on military as well as economic assistance, emphasizes frequent cultural exchanges, and generally does its utmost to keep relations friendly. Toward pro-Western countries, Moscow combines threats with conciliatory gestures, including offers of economic assistance, with the obvious intention of loosening the target countries' ties with the West. When a country with a traditionally fixed inclination toward the West looks as though it could be tilted even slightly in the other direction, Moscow sometimes offers a wide range of enticements, including military aid. Iran and Pakistan are two countries receiving such aid.

In the Middle East, the U.S.S.R. since the mid-1950's allied itself with Arab nationalism, whose rallying point was the struggle against the remnants of Anglo-French imperialism and against the state of Israel. The Soviets, however, have not entirely escaped the pitfalls that come with abetting a radical nationalism which is hostile to all outside pressure. In 1958 the Soviets could not hide their chagrin when Egyptian President Gamal Abd al-Nāsir became President of the United Arab Republic, in which Syria and Egypt briefly joined and promptly suppressed the Syrian Communists, whose steadily waxing strength Moscow had been watching with approval. Moscow was further upset in the same year by Nāsir's all-out propaganda attacks on communism, which were set off by his concern over Soviet support for the pro-Communist Qāsim regime in Iraq. The ensuing public exchange of charges between Khrushchev and Nāsir did much to inoculate Arab public opinion against communism and encouraged Arab skepticism about Soviet motives. The Soviets have since shown more sensitivity to the danger of overtly supporting Arab Communists and have encouraged local party members to join forces with indigenous "progressive" elements, such as Egypt's Arab Socialist Union.

The quick Israeli victory over the Arabs in June 1967 and the hasty Soviet efforts to get a cease-fire jeopardized Arab confidence in the real value of Soviet friendship and tutelage. When the fighting slackened, however, Moscow moved fast to revalidate its credentials by a rapid military resupply operation.

Subsequently, the Soviets began a continuing series of "friendship" visits to Arab ports by units of their greatly enlarged Mediterranean squadron. They also took advantage of Arab bitterness toward Israel's Western supporters, especially the United States, with friendly approaches to traditionally pro-Western countries, including offers of military aid to Jordan and the Sudan.

Partly to make up for the seemingly weak Soviet posture during the fighting, Moscow in late 1967 reacted in surprisingly rapid and thorough fashion to a call for help from the Yemen Arab Republic, whose position vis-a-vis the royalists had been weakened by the withdrawal of Egyptian troop support following the war with Israel. Soviet aircraft transported military supplies and such basic material as oil to the beleaguered republicans, and for a brief time Soviet pilots even gave air support to republican fighting forces.

With the breakdown of the cease-fire along the Suez Canal in 1969, Israel began damaging and humiliating air strikes deep inside the U.A.R. The Soviets acted quickly to provide additional military assistance in support of a state vital to their position in the Middle East. In early 1970, Moscow sent Egypt a large number of SA-3 missiles manned by Soviet crews and established several Soviet-piloted fighter squadrons to fly defensive patrols. These measures, while providing security against Israeli attacks, also led to a serious heightening of tension in the area as the possibility of a Soviet-Israeli clash mounted. Meanwhile, the prospects for a peaceful settlement improved somewhat with Egyptian and Israeli acceptance of a U.S. cease-fire proposal in early August.

The Soviet Union has succeeded in expanding its influence somewhat among the newly independent African states, but it seems to have lost some of its initial enthusiasm about the opportunities there. The Soviets have become much less inclined to count on local radical or "liberation" movements, apparently feeling that few of them offer any prospect of early success. Moscow continues to finance various African Communist parties, but none of these is much of a threat to the local government. The military overthrow of the strongly Soviet-supported Nkrumah government in Ghana in 1966 was a discouraging and embarrassing blow and a lesson in the dangers of heavy investment in an unstable, albeit radical, regime. The Soviet image in Africa has suffered also from the open competition with Communist China, most notably in the power struggle which split the Afro-Asian People's Solidarity Organization and reduced it to almost insignificant proportions. The public airing of Sino-Soviet differences and the consequent baring of their ambitions disillusioned many Africans.

The Soviets are still giving at least token assistance to some of Africa's more promising rebellious groups by means of propaganda, funds, and even guerrilla training, but the main Soviet effort to influence local events is made through the normal channels of diplomacy and economic and cultural exchanges. These

are supplemented when possible by the supply of military equipment, as in the case of Nigeria, where the Soviets in late 1967 dramatically airlifted fighter aircraft and other materiel to help the federal government during the civil war. Nevertheless, the Soviets have tightened their purse strings throughout most of Africa and weigh carefully the merits of any investment of prestige as well as money.

In Latin America, the Cuban revolution in 1959 gave the U.S.S.R. a chance to show its support for a socialist country within the shadow of the United States. Castro's radicalism, however, came into conflict with larger Soviet interests in the area. The Soviets believed that Castro's revolutionary tactics were quixotic and historically untimely in relation to present conditions in Latin America. Although they have tried privately and publicly to disassociate themselves from his philosophy of "exported" revolution, they did not lessen their vital economic and military support (Cuba's economy is unique in its almost total dependence on Moscow). The death of Che Guevara, however, appears to have prompted Castro to reexamine his revolutionary strategy for Latin America and to place less stress on violence where conditions were unfavorable. The Soviet-Cuban relationship began to improve. This improvement also owed much to Castro's qualified endorsement of the Soviet intervention in Czechoslovakia. Though some difficulties still hamper relations, Soviet-Cuban ties seemed more cordial in 1970 than they had been for some time.

Elsewhere in Latin America, the Soviets continue to cultivate improved relations on the basis of the conventional tools of diplomacy. A relatively recent development in Moscow's policy has been its changed attitude toward military regimes. The military governments of Peru and Bolivia have been singled out by Moscow for special praise. Most recently, the election of a Marxist as President of Chile has been viewed by the Soviets as a vindication of their thesis that electoral tactics by Marxist parties can be proved successful in parliamentary democracies. These regimes are now labeled "progressive" by the Soviets, and as examples for all Latin America to follow.

C. SOVIET POLICY TOWARD THE WEST AND JAPAN—Toward the West, the post-Stalin leaders have intermittently followed policies of détente so as to lessen the dangers of armed confrontation. In 1954 the Geneva Conference halted hostilities in Indochina; the Austrian State Treaty was signed in 1955; a limited relaxation in relations was apparent following a four-power (United States, United Kingdom, France, U.S.S.R.) summit conference in July 1955 and during the Soviet campaign leading up to the proposed summit conference in Paris in May 1960.

Khrushchev's disruption of the May 1960 meeting, using the U-2 incident as a pretext, ended the détente period and ushered in a new, militant phase of Soviet foreign policy. The U.S.S.R. broke off negotiations on disarmament, gave strong encouragement to Castro in his hostility toward the United States, shot down an

American RB-47 reconnaissance plane over the Arctic Ocean and imprisoned the two surviving members of its crew, vigorously supported the Lumumba faction in the Congo, and opposed U.N. activities in that country. To a large extent, this heightened intransigence reflected a need to counter Chinese Communist charges of Soviet capitulation to the "U.S. imperialists."

The Cuban missile crisis in 1962 brought another sharp turn in Soviet policy toward the West. Since that event the Soviet Government has generally displayed great caution in its international commitments and shown an inclination to stabilize power relationships.

The renewed Soviet emphasis on a détente policy has been most marked in Western Europe. The Brezhnev-Kosygin team which ousted Khrushchev in 1964 has sought whenever possible to reassure the Western Europeans that the days of the cold war are over and that there is much mutual profit to be gained from an accommodation. Moscow has encouraged and sought to portray the independent policies of France as an example of the kind of cooperation which has become possible between the Western European states and the "new and reasonable" U.S.S.R. The Soviets have repeatedly broached the idea of a new security arrangement for Europe reached through a conference of European states, with the U.S. role diminished as much as possible, and they profess their willingness to dissolve the Warsaw Pact if the North Atlantic Treaty Organization (NATO) will disband. Besides seeking the diminution of U.S. influence in European affairs, their professed aim has also been to include a settlement of the German question within the broader framework of European security. Although the Soviets are still keeping this proposal alive, more recently they have shifted to direct negotiations as the principal instrument for legitimizing the existing political and territorial divisions in Europe. In late 1969 the Soviets began negotiations with the West Germans on a "renunciation of force" agreement. The resulting treaty was signed in Moscow in August 1970 but still awaits ratification by both countries. In early 1970 they entered into four-power talks on Berlin. Soviet interest in the former centered on winning a final and legally binding recognition of the postwar borders from Bonn. Moscow sought to use the Berlin talks to wrap up a favorable settlement of the German problem, pushing hard for the establishment of West Berlin as an "independent political entity" with only minimal ties with the German Federal Republic.

While generally continuing Khrushchev's latter-day policies in Western Europe, however, his successors have been somewhat less forthcoming toward the United States. Behind this stance was their decision to reassert Moscow's leadership in the Communist world by restoring a more even balance between Soviet efforts at détente with the West and support of Communists throughout the world against the "imperialists." It is with this objective in mind that the Soviets moved to support North Vietnam and maintain that support despite Hanoi's failure to accept Soviet counsel on the best way to pursue its aims.

Nevertheless, the Brezhnev-Kosygin regime maintains that the lines of communication between the United States and the U.S.S.R. must be kept open, and it holds out the hope that mutual hostility and suspicion may some day decline. This regime cooperated with the United States in drafting the treaty on nuclear nonproliferation, and it agreed to enter into talks on strategic arms limitations. Indeed, despite their many reasons for sober concern about their position vis-a-vis the United States, the Soviets evidently began to feel that China was becoming their most pressing international problem and that policies on other issues would have to be tailored accordingly. In June 1969 they issued a call for a collective security system in Asia, and they have taken the position that, because of China, unnecessary difficulties with the United States should be avoided, at least so long as relations with Peking remain tense.

Moscow's policies toward Japan have been characterized by ambiguity, suspicion, and caution. The U.S.S.R., cognizant of Japan's growing economic strength, has been interested in expanding trade contacts and attracting Japanese capital for the development of Siberian raw materials. At the same time, Moscow has viewed the conservative Japanese Government as the U.S. surrogate in Asia and has displayed increasing concern over Japan's military and political intentions in the Far East. In addition, Tokyo's demands for the return of the "Northern Territories"—the southern Kuril Islands seized by the U.S.S.R. from Japan at the end of World War II—has served to sour relations. Soviet relations with Japan have been further complicated by Moscow's inability to tolerate the independence of the Japanese Communist Party, which has frequently been a vigorous critic of Soviet policies. Although in the late 1960's Moscow displayed growing interest in establishing friendly ties with Tokyo, in part in order to head off the possibility of a Tokyo-Peking rapprochement, the Soviets are not willing to pay the price for Japanese good will that a generous offer of the "Northern Territories" would give them, nor are they willing to open up Siberia to economic exploitation on terms that would be highly attractive to Japanese capitalists.

d. THE SOVIETS AND THE COMMUNIST WORLD—The Sino-Soviet dispute reached critical proportions in 1960. In the summer of that year Khrushchev suspended Soviet assistance to the Chinese Communists, which only deepened their antagonism. In November, 81 Communist parties met in Moscow where the Chinese, supported by Albania, North Korea, and several delegations from non-Communist countries, carried on the attack against the Soviet effort to dictate to the movement. The intrabloc conflict was only papered over by the conference's concluding statement, which militantly reaffirmed the ultimate goal of a worldwide Communist system and asserted that the transition to such a system, though by peaceful means ("peaceful coexistence"), was the trend of the times.

Khrushchev persisted in an effort to secure another world Communist meeting that would in effect read the Chinese out of the movement. The leadership which ousted him in October 1964 was compelled to follow through to the extent of holding a "consultative meeting" of 19 parties in March 1965. Its inconclusive results were embarrassing to Moscow, and the failure of the Soviet effort to reassert leadership in the Communist world only aggravated the problem.

Kosygin's trip to Hanoi in the preceding month had been undertaken to counter Chinese influence there. Moscow's hope was to move North Vietnam back toward a more nearly neutral position in the Sino-Soviet conflict. Soviet calculations were temporarily upset by the chain of events set in action by a Viet Cong attack on U.S. installations in South Vietnam and the retaliatory U.S. air strikes against North Vietnam while Kosygin was in Hanoi. The failure of the Soviets to riposte in some dramatic manner laid them open to further Chinese charges of weak-kneed capitulation to the United States.

During the following year, Soviet assistance to Hanoi grew, as did the dispute with China. The Soviets accused the Chinese of hampering North Vietnam's war effort by refusing to associate themselves with a united Communist aid program and claimed that the Chinese had in fact interfered with Soviet shipments through China. When China's self-discrediting "cultural revolution" got well under way, Moscow began talking again of a new world Communist conference.

By marshaling the support of the loyal Eastern European parties and a host of nonruling parties, the Soviets eventually managed to stage the second "consultative meeting" of over 60 parties in Budapest in February 1968. No Far Eastern parties—excepting Mongolia's—were among the delegations, and the Cubans, who had attended the March 1965 gathering, also were absent. The Soviets used pressure tactics to secure a communique calling for preparations for a world Communist conference in Moscow. The International Communist Conference—without the participation of China—finally met in June 1969, but the victory was only a Pyrrhic one in terms of Soviet efforts to reestablish their primacy in the world movement.

The Sino-Soviet dispute took a new, dramatic turn in the spring and summer of 1969 when a series of clashes occurred along several disputed sections of the Chinese-Soviet border. The Soviet leaders combined threats of military action against China with proposals for negotiations in an attempt to force the Chinese to resolve the frontier dispute. Peking finally agreed to the Soviet demand for talks in the fall of 1969, but the negotiations dragged on through 1970 with no significant progress. Nonetheless, Moscow and Peking sought to reduce the level of tension that had prevailed during the border fighting and took some steps, such as exchanging ambassadors, designed to put state-to-state relations on a more normal footing. The Soviets seem temporarily reconciled to a diplomatic stand-off on the

border issue, and Soviet officials have indicated that their hopes for the future must depend on Mao's successors. Meanwhile, the U.S.S.R. is steadily strengthening its military forces along the Chinese border.

The Soviet decision to press for as much conformity at Budapest as possible was not only prompted by the Chinese heresy; it was probably influenced greatly by problems closer to home. The ouster of Antonin Novotný from control of the Czechoslovak party in January 1968, the concurrent signs of unease in Poland, Romania's determination to flaunt its independence, the progress of West Germany's new policy of rapprochement with Eastern Europe, and, not least of all, the intellectual ferment within the U.S.S.R. itself evidently persuaded Moscow that it was necessary to tighten its grip on those parties it was still able to influence.

The 1968 Budapest consultative meeting was followed in quick succession by two sessions of the Warsaw Pact nations which again illustrated Moscow's declining fortunes in East Europe. The first, in Sofia in late February, found the Romanians once more at odds with the Soviets and refusing to join the other six pact members in approving the U.S.-Soviet draft treaty on nuclear nonproliferation.

The second was a closely guarded gathering of the six in Dresden, East Germany, in late March. The main subject was the problem presented by the liberal reform program being espoused by the new party hierarchy in Czechoslovakia led by Alexander Dubček. The Soviets, Poles, and East Germans apparently feared that the program could lead to demands in their own countries for a similar relaxation of Communist party control over the government and the public. Further, despite repeated official Czechoslovak professions of friendship and solidarity with the U.S.S.R., the temper in Czechoslovakia appeared to foreshadow a more independent line in foreign affairs, especially economic, that would run counter to Moscow's policy of containing West Germany and might undermine the effectiveness of the Warsaw Pact.

The Soviets responded to Czechoslovakia's growing assertiveness by leading loyal Warsaw Pact allies in a campaign of increasing political and military pressure. Warsaw Pact troops massed on the Czechoslovak frontiers, and the Czechoslovak reformers were subjected to a growing torrent of propaganda attacks which culminated in the Bratislava and Čierna meetings between Czechoslovak leaders and other Warsaw Pact leaders in late July and early August. The failure of the Czechoslovaks to heed warnings conveyed at these meetings confronted the Soviets with a choice of allowing the Czechoslovaks to pursue their own path or of resorting to force to eliminate the danger that they would spark an uncontrolled political evolution in the socialist camp. The August 1968 invasion demonstrated that Moscow believed its vital security interests were threatened.

The Soviet rationale for this action was enunciated in the so-called Brezhnev doctrine, or doctrine of "limited sovereignty," which alleges that the U.S.S.R. and other

socialist states have the duty and obligation to intervene in defense of socialism anywhere it may be threatened. The "doctrine" underscores both Moscow's determination to maintain its hegemony in Eastern Europe and the essential fragility of its position. With the passage of time the "doctrine" has been downplayed by the Soviets but never repudiated.

3. Defense

The Soviet Government has always regarded a strong military establishment as a prerequisite for effective foreign and domestic policies. The leaders justify a high degree of military preparedness by insisting that their country is threatened by hostile capitalist nations. For years the Soviet leadership insisted that Western hostility meant that war between the capitalist and Communist countries was inevitable. At the 20th Party Congress in 1956, however, Khrushchev laid down the dictum that war was no longer inevitable because the socialist countries had become so powerful the "imperialists" were afraid to attack. Nevertheless, the need for Soviet military vigilance was held to persist in view of the alleged possibility that "world capitalism" might at any time launch a war to prevent its further decline. Both this interpretation and the subsequently evolved concept of nuclear stalemate between East and West reflected a more optimistic assessment of the Soviet Union's military position in the world. Since early 1966, however, Soviet statements have indicated a reevaluation of certain assumptions behind Khrushchev's dictum and recognition of the possibility that the U.S.S.R. could become involved in a nonnuclear war.

The share of gross national product (GNP) allocated for defense has fallen from about 14% in 1955 to about 8% in recent years, and is now approximately three-fourths of the U.S. military expenditures as a percentage of GNP. Total expenditures for defense and space, however, grew in the 1960's. Three periods are evident: substantial increases in 1961-63, a slowdown in growth in 1964-65, and a sharp acceleration in 1966-69. The growth in spending during the 1966-69 period was the most rapid for any 4-year period since 1950. The announced budget for 1970 sharply reduced this growth rate to just 1% over the 1969 figure.

The pattern of Soviet defense spending in recent years has reflected shifting emphases in military programs. In the late 1950's, savings effected by reductions in military manpower were increasingly offset by the introduction of costly weapons systems. In January 1960, Khrushchev announced plans for a sharp reduction of the armed forces by 1.2 million men, or a claimed one-third of the Soviet military establishment. The move was held to be completely justifiable as a result of greatly improved missile capabilities, but it was unpopular with many senior military leaders who continued to demand large-scale conventional forces in support of the nuclear deterrent. Although some troops were demobilized, reductions had generally stopped by the time of the Berlin crisis of 1961, and the force level

may actually have increased somewhat during the following year. Khrushchev's successors accelerated the deployment of strategic weapons systems, including ICBM's—well along in development by 1964—while at the same time expanding the capabilities of Soviet conventional forces.

The party has generally strong political control over the military services, exerted chiefly through the Main Political Directorate of the Soviet Army and Navy. This directorate, which is in reality a department of the Party Central Committee and thus accountable to the Party Secretariat, supervises a system of deputy commanders for political affairs and an extensive network of party and Komsomol units in all military formations above company level. Counterintelligence officers of the Committee for State Security (KGB), responsible for maintaining security and ferreting out anti-Soviet tendencies, are also assigned at all levels in the military structure.

Party controls over the military may have been relaxed somewhat after Stalin's death. In any event, Marshal Georgy Zhukov, after siding with Nikita Khrushchev against the "antiparty group" in June 1957, apparently attempted to capitalize on his increased political authority and to reduce the party's role in the armed forces. Zhukov was dismissed as Minister of Defense and as a member of the Party Politburo in October, and thereafter the party took several steps to insure the strict controls which are still maintained. Since Khrushchev's removal in 1964, however, the party leadership under Leonid Brezhnev's influence has given a more sympathetic hearing to the counsel offered by the military leaders on purely professional matters, and this has led to a marked improvement in relations between the party and the military.

Besides demanding a permanent state of readiness, the Soviet regime lays great stress on imbuing the citizenry with a favorable attitude toward its defense policy. Propaganda directed to both the troops and civilians emphasizes that Soviet patriotism knows no greater honor than to fight and die in defense of the homeland, and the exploits of the Soviet Army are regularly glorified. Efforts are constantly made to encourage broad public participation in civil defense activities, and mass sports programs are tied closely to them. Military service is required of fit males, and various voluntary paramilitary societies provide training for civilians. The Brezhnev-Kosygin regime in fact has given increased attention to these activities, adopting new programs for civil defense and changes in the military conscription law that will have the effect of increasing civilian exposure to military activities. Under provisions of the new law, for example, basic military training has become part of the curriculum of secondary general education schools, and a compulsory civil defense training program was initiated in January 1967 on a national scale, administered by local civil defense staffs in conjunction with the heads of all enterprises, farms, and institutions. Because only a small portion of the population would be protected by existing shelter

areas, civil defense training emphasizes urban evacuation procedures and the improvisation of emergency fall-out shelters.

E. Police and intelligence services

The police apparatus necessary for maintaining control of the Soviet state was established in December 1917, a little over a month after the Communists seized power. As the Communist bureaucracy grew, the police and security forces came to play an increasingly important role in Soviet national life. The security police, especially, served as one of Stalin's principal weapons in eliminating internal opposition and establishing dictatorial rule.

During the months immediately following Stalin's death, the security police continued to play a political role under the leadership of Politburo member Lavrenty Beriya. Beriya's party colleagues, however, feared his power and formed a common front against him. Following his execution in 1953 on a charge of treason, party control of the police and security forces was more firmly implemented. As Khrushchev gathered political strength, he increasingly favored persuasion rather than force as an instrument of rule, and there was

considerably less use of the police apparatus for crude suppressions of internal dissidence and disloyalty. Instead, the security police were encouraged to concentrate on their assigned functions of espionage and other clandestine activities abroad and counter-espionage at home. The Brezhnev-Kosygin regime has continued the practice of persuasion but has also stepped up the use of repressive measures, particularly in dealing with so-called anti-Soviet dissidents. The combined police and security apparatus under the present regime, as in Khrushchev's time, is extensive and highly centralized (Figure 105).

In general, post-Stalin policy has tended toward close supervision of the police and security forces. This reflects both a determination of the party leadership to avoid political bloodletting and an increase in the regime's confidence in its own security. It also reflects the regime's greater ability to satisfy popular discontent with material goods and its appreciation of the widespread psychological damage done during the reign of terror, which had a counterproductive effect on economic and social life in the country. Nevertheless, police controls remain an integral part of Soviet life and are strong insurance for the regime's security.

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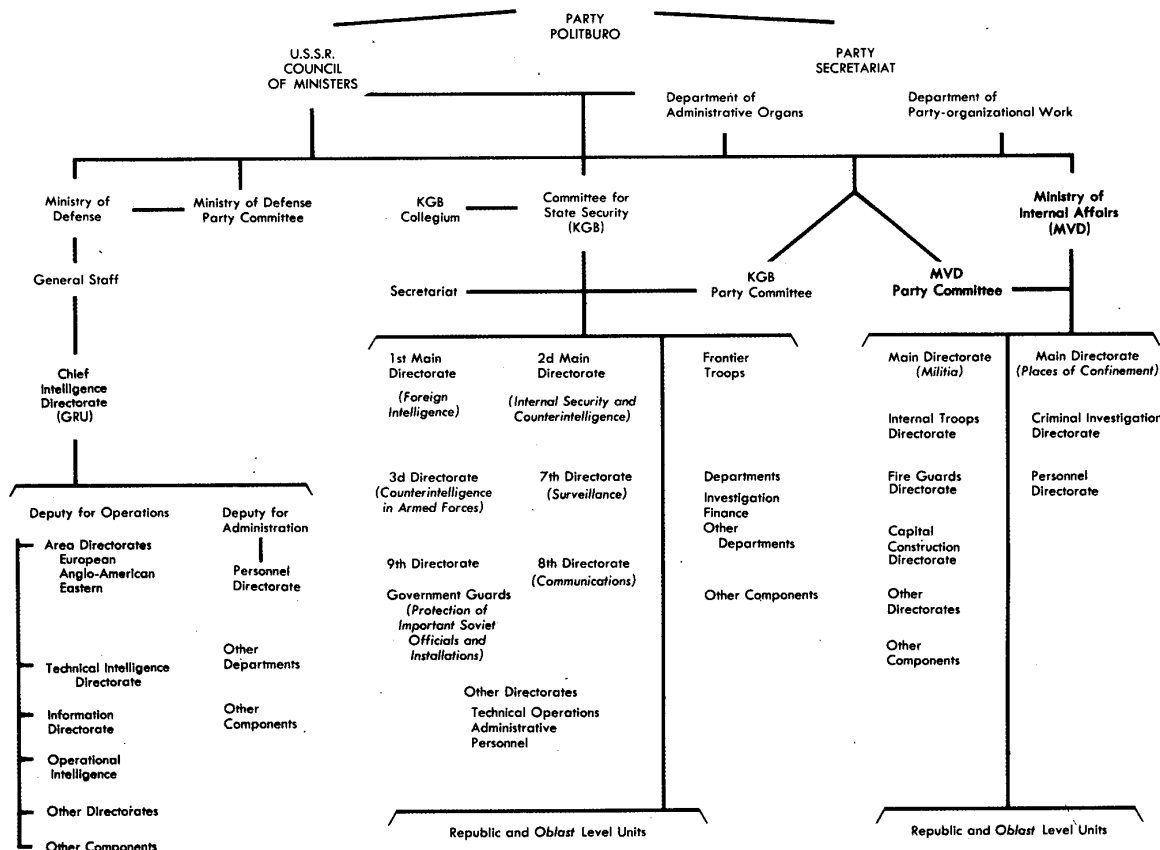


FIGURE 105. Police and intelligence services (S)

1. Police forces—MVD

In January 1960, the functions of the U.S.S.R. Ministry of Internal Affairs (MVD)—preservation of law and order and the protection of state and personal property—were decentralized by the abolition of this body and the transfer of its functions to the MVD's at the republic level. In August 1962, the republic ministries were redesignated ministries for the maintenance of public order (MOOP's). Like many of Khrushchev's reforms, this one was also reversed by his successors. In July 1966, as part of a major anticrime campaign promoted by the police and sanctioned by the government, the MOOP system was recentralized by the establishment of the U.S.S.R. MOOP and the direct subordination of republic level MOOP's to it. In November 1968, the designation MOOP again reverted to MVD, which, like the original MVD and its successor MOOP, is the primary law enforcement body in the U.S.S.R. Although MVD officials at times become involved in cases of state security and assist the primary security agency, the KGB, their investigative work is generally limited to crimes of a nonpolitical nature. The local agencies of public order under the jurisdiction of the MVD's are responsible also for firefighting, maintaining governmental archives, and administering the penal system. Prison camps, which provided the Stalin regime with forced labor, are now significantly fewer in number, and they are used less for economic exploitation than for detention of criminals.

Although officials and ordinary uniformed police of the MVD apparently perform their duties without undue harshness in ordinary circumstances, lax discipline and incompetence have tended to tarnish the image of the MVD and to decrease respect for the uniformed police. The police spend considerable time discharging their responsibility for the operation of an elaborate and stringently enforced internal passport system and other unpopular controls. In "controlled areas," such as Moscow, Leningrad, the Baltic republics and the entire border zone, and major urban areas, local MVD sections issue passports which residents must carry at all times. All Soviet citizens must register with the local MVD any change in residence exceeding 3 days in cities and 30 days in rural areas.

The police have the primary responsibility for combating crime and various forms of public misconduct, which continue to be a problem in Soviet society. Although not subject to much attention in the Stalin period, juvenile delinquency and drunkenness have been regularly publicized since about 1958. In 1970 the emphasis of the antialcoholism movement paralleled the regime's campaign to decrease labor absenteeism due to drunkenness and to increase labor productivity. Apparently as a result of this linkage, the price of vodka increased significantly and the hours during which vodka could be sold were reduced. In addition, articles appearing in the Soviet press in late 1969 and early 1970 suggest that drug addiction may be developing into a serious problem in some republics.

Citizen volunteers, the so-called "people's guards," supplement regular police controls in combating these various social ills. Such groups lack the authority of the regular police but are nevertheless in a position to detain people and exert social pressure.

2. Security and intelligence—KGB

The Committee for State Security (KGB), headed by Yury Andropov, is the primary intelligence and sole security agency of the Soviet Government. Prior to his replacement of Vladimir Semichastny as security chief in May 1967, Andropov had made his entire career—except for his service as Ambassador to Hungary during 1953-57—as a party functionary. Most recently he had been a central party secretary, overseeing relations between the Soviet Communist Party and the other ruling Communist parties. His assignment to the KGB was, in part, a political move aimed at reducing the influence of Party Secretary Aleksandr N. Shelepin in intelligence and security matters. Shelepin had been a former KGB chief and close political ally of Semichastny. Soon after assuming his security post, Andropov became a candidate member of the Party Politburo and was dropped from the Secretariat. He is the first security chief with status on the ruling group since Lavrenty Beriya was eliminated from the political scene in 1953. Although the move may have made him less accountable to the Party Secretariat, he still must answer to his senior colleagues on the Politburo, which directs all KGB operations and activities.

The KGB is primarily responsible for investigating political and state crimes and for conducting espionage and counterintelligence. Although called a committee, suggesting that it might have strictly supervisory and coordinating functions, the KGB is primarily an operational agency. Created in 1954, the KGB is a belated successor to the Ministry of State Security (MGB), which had been subsumed into the MVD in 1953. Party control is exercised through the Administrative Organs Department in the central executive staff of the party. KGB chiefs at the all-union and republic levels are members of the corresponding councils of ministers. Within the U.S.S.R., the KGB utilizes extensive networks of agents and informants controlled by staff security officers to protect national security. Much of the operational work is done at the province (*oblast*) level, where major attention is given to serious economic crimes such as speculation, embezzlement, and counterfeiting. Frontier troops are part of the KGB, but internal troops—security troops, convoy guards, and the like—are subordinate to the Ministry of Internal Affairs.

One of the principal objectives of the KGB is the procurement of all types of information abroad. It also conducts operations within foreign countries designed to penetrate foreign intelligence services and other organizations believed to threaten the security of the U.S.S.R. It has been known to carry out covert operations abroad for the liquidation of individuals considered to pose a sufficient threat to the regime. Its

organization and resources are greater than, and its activities far exceed, those of the military intelligence service.

3. Military intelligence—GRU

The Chief Intelligence Directorate (GRU) of the General Staff of the Soviet Armed Forces has primary responsibility for the procurement of technical and military intelligence from outside the U.S.S.R., but it also collects economic, political, and scientific information. Counterintelligence within the armed forces, however, remains a responsibility of the KGB, whose duty it is to uncover anti-Soviet attitudes or deviation among military personnel and to counteract attempts of foreign agents to penetrate and subvert the armed forces. Reports on these subjects are channeled directly to KGB headquarters in Moscow and not through the Ministry of Defense. The jurisdictions of the KGB and the GRU overlap somewhat and some rivalry exists. Their activities appear to be coordinated at a high level, however, and what is known of their activities reveals them as effective agencies. Both the KGB and the GRU have achieved conspicuous successes in intelligence operations abroad, even in the penetration of highly sensitive and important agencies of foreign governments. Abroad, both the KGB and GRU rely upon both staff intelligence officers and nets of agents controlled by these officers to carry out the clandestine aspects of Soviet foreign policy. Staff personnel of both services, sometimes using aliases, are assigned undercover missions in Soviet diplomatic and other installations abroad. KGB and GRU officers are to be found holding some of the highest posts in embassies, legations, and consulates. Military, naval, and air attaché posts are occupied by GRU officers, while press, commercial, and other nondiplomatic positions are also predominantly occupied by intelligence officers. In fact, all Soviet agencies abroad—including TASS (the official Soviet news agency), TORGPRED (commercial missions abroad, official trade agencies, and so forth) are used to a greater or lesser extent as cover agencies for Soviet intelligence activities.

F. Opposition, dissent, and subversion

There is no evidence of widespread subversive activity in the U.S.S.R., and the attitude of the Soviet citizen is generally one of passive acceptance of the Communist regime. Outspoken dissent has been rare and generally an individual act of defiance, but in recent years, especially since Khrushchev's ouster in late 1964, relatively small numbers of civil-rights activists, mostly intellectuals, have increasingly protested in public appeals against regime policies. Pervasive police surveillance and controls, however, have apparently kept dissent within limits the regime is willing to tolerate.

Although subversive acts have been isolated and rare since the 1930's, there were major exceptions during and immediately after World War II. At the end of the war

much of the U.S.S.R. was in chaos. Rampant crime in the cities and famine in some rural areas were accompanied by the additional problem of large partisan movements in territories acquired during the war—Moldavia, the Baltic states, and the western parts of the Ukraine and Belorussia. To cope with these and other problems resulting from the upheavals of war, the regime retained most of the wartime controls over the population and reinstated the strict ideological orthodoxy that had been eased during hostilities. Order had been restored in most of the country by the end of 1949; that year marked the successful conclusion of large-scale police operations against partisan groups in the western Ukraine and their elimination as a major nucleus of resistance.

Occasional public disturbances, caused by political or economic dissatisfaction, have been quickly and usually ruthlessly quelled. Stalin's death in 1953 led to large-scale strikes in the Siberian prison camps of Vorkuta and Norilsk, but the party leadership generally succeeded in preventing serious disorders during the transition to the new political regime. In the early part of 1956, however, Khrushchev's denunciation of Stalin at the 20th Party Congress aroused the wrath of Stalin's admirers in Georgia, where mass demonstrations broke out and troops were required to restore order. Lithuania was also the scene of demonstrations in November of that year. Employee dissatisfaction with wages and working conditions was the apparent cause of riots which occurred at Temir-Tau, near Karaganda, in the fall of 1959 and in Rostov Oblast' in 1962. Similar civil disturbances also occurred in Chimkent in 1968 and in Tashkent in 1969.

No organized subversive groups of any significance are known to exist in the U.S.S.R. Some tenuous connections between emigree groups in the West and dissatisfied elements in the U.S.S.R. may exist, but their significance seems negligible. Occasionally the Soviet press carries reports on the activities of "nationalist bandits," and religious groups such as the Jehovah's Witnesses and the Baptists are frequently denounced as "subversive." Members of these groups have been tried and sentenced for "subversion," but there is no evidence that their activity has posed a serious threat to the regime's political or social stability.

"Bourgeois nationalism" continues to appear in the minority republics. Nationalist feelings and anti-Russian sentiment have been particularly marked in the Baltic states, the western Ukraine, and Moldavia, and may be evident in parts of Central Asia as well. Especially in recent years, as the political bonds between the U.S.S.R. and Romania have weakened, the Soviet regime has sought to counteract the effect of Romanian nationalism on the population in the *irredenta* of Ukrainian Bukovina and Moldavian Bessarabia. In order to neutralize these and other potentially subversive areas, the Soviet authorities have sought to reduce some minority grievances, while maintaining central discipline.

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The attitude of the regime toward other groups that under Stalin had had subversive tendencies has shown similar conciliatory tendencies. Efforts have been made to improve the lot of the peasants, once one of the most dissatisfied sectors of the population. On the other hand, the regime's handling of the intellectual community has been ambivalent, and in certain respects has taken a retrogressive turn since Brezhnev and Kosygin came to power. Writers and artists especially had won slightly more latitude to express themselves under Khrushchev, despite recurrent campaigns which party ideologues and literary dogmatists conducted against the liberalizing trends. Khrushchev's successors, however, have punished, with varying degrees of severity, intellectuals, including members of the scientific intelligentsia, who have appeared to them to pose a danger to the established social and political order. The show trial of dissident writers Andrey Sinyavsky and Yuly Daniel in early 1966 and subsequent trials of other nonconformist intellectuals for allegedly subversive activities have had the effect of narrowing the politically permissible limits of expression. Some outspoken critics of the regime continue to be active, primarily in petitioning the government, and appear to be tolerated by the regime. Jews seeking permission to migrate are among the largest and most frequent petitioners. Public protests are closely watched and usually broken up, however, and all unauthorized organizations are suppressed. One dissident group has managed to publish a bimonthly journal, the *Chronicle of Current Events*, on a regular basis since April 1968. The *Chronicle* is a narrative account of violations of legality by the regime. In 1969-70, a potentially more significant development was the *samizdat*, or underground, publication of political programs advocating sweeping political and economic reforms. Nevertheless, these developments do not necessarily indicate increased toleration of dissent by the regime. If the regime should decide that any type of dissidence is a serious threat to the established order, it will undoubtedly use the extensive and effective machinery at its disposal to suppress the responsible dissident groups.

G. Propaganda programs

1. Domestic

The energy and capital expended by the government on propaganda are quite out of proportion to the normal efforts of any non-Communist state to obtain support for its policies. Soviet leaders use propaganda to inspire popular support from their own people for national policies, as well as to attract support abroad for a regime which, despite its great economic strides, still compares unfavorably with leading Western democratic states in living standards, economic and technological progress, and especially political and creative freedoms.

The basic premise of Soviet propaganda is that only the adoption of the socialist system of the U.S.S.R. can end the "exploitation of man by man" which it claims is

inherent in "capitalism," where the means of production are not owned by the public (i.e., the state). The Soviet line holds that, despite capitalist industrial growth and material wealth, the workers in capitalist countries will always be denied the fruits of their labors by the "exploiters"—capitalist trusts, syndicates, and banks. Capitalist exploitation becomes ever more acute, according to this line, and unemployment remains a chronic scourge because of the chaotic unplanned nature of the capitalist economy. Underlying Soviet Communist theory and propaganda is the idea that the broad masses of workers in capitalist countries will eventually come to recognize the "depraved" nature of such a system and follow their country's Communist Party, which will come to power either through parliamentary means or by revolution, depending on the measure of resistance offered by the capitalist class.

In contrast, the Soviet system is portrayed as the highest form of democracy, "socialist democracy," which allegedly guarantees "the most important freedom—freedom from exploitation." To safeguard this freedom, the people "voluntarily" join forces with the workers' vanguard, the Communist Party, to whom they entrust the formulation of state policy in the interest of national welfare and happiness. The U.S.S.R. does not claim to have achieved full communism—still a hazily defined concept—but purports to be closer to that "ultimate" social order than any other country.

Although militantly hostile to all alien ideologies, the Soviet Government nevertheless advocates the "peaceful coexistence" of states with different sociopolitical systems. But it alleges that the "monopolistic and reactionary forces" in capitalist countries refuse to accept the principle of peaceful coexistence and actively pursue an anti-Soviet policy. These countries, according to Soviet propaganda, have continued to threaten the U.S.S.R. and "fraternal socialist" countries with military bases, have formed aggressive military blocs such as NATO, encourage revenge-seeking militarism in West Germany, and try to foment "small wars" as in Korea and Indochina. A world war is not fatally inevitable, according to Soviet doctrine, because the "imperialist capitalist for25X1re deterred by the confrontation with Soviet military power. But the possibility of armed conflict requires constant vigilance and pressure on capitalist governments to accept the foreign policy proposals of the Soviet Government.

The Communist Party has arrogated to itself the role of teacher, guide, and leader of all aspects of Soviet-style socialist society. Its primary control center for propaganda is the Propaganda Department of the Party's Central Committee. Figure 106 shows the main elements of the Soviet propaganda system. The Propaganda Department has counterparts in the lower party committees; moreover, each Communist, whatever his position, is expected to consider the dissemination of official propaganda a personal concern.

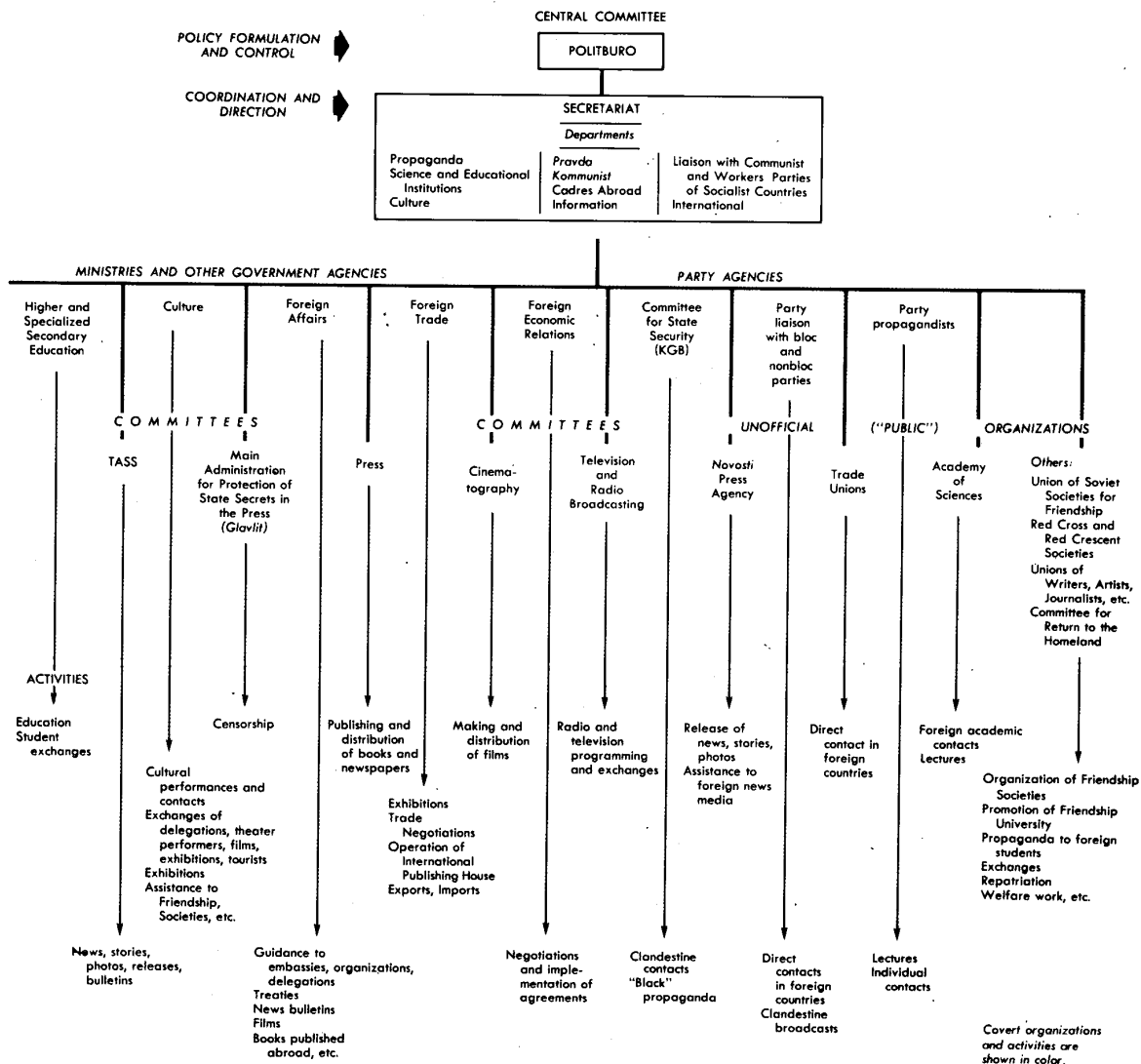


FIGURE 106. U.S.S.R. propaganda apparatus and activities

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Every major field of activity has an information agency, organized in a hierarchical structure, to mobilize public opinion. Each level of these hierarchies has its equivalent-level party committee to provide guidance in the party line. Among the principal information agencies are the indoctrination and propaganda systems of the party itself, the youth organizations, the trade unions, the governmental ministries, and the armed forces. Every factory, farm, military unit, and even penal institution has at least one person charged with propaganda. Obligatory lectures which formerly were conducted at places of work before a captive audience are now, with the introduction of the shorter 5-day workweek, being organized by party propagandists at places of residence during leisure hours.

Schools, the press, radio and television, motion pictures, literature, art, and to a certain extent science have a major responsibility to carry the party line to the people. A governmental monopoly on printing is established by law.

The effectiveness of Soviet domestic propaganda cannot, of course, be gaged statistically. Most Soviet citizens do not believe everything they read in their newspapers; in fact, most are skeptical about all public information, domestic as well as foreign. In public, however, they usually consider it safer to repeat authorized points of view. Although regime propaganda clearly falls far short of its avowed purpose, it does have a numbing effect that aids in maintaining stability and control. Its impact, however, is being somewhat affected by growing contacts with the non-Communist world.

2. Propaganda directed abroad

In propaganda directed abroad, the scope of Soviet efforts ranges far beyond the normal use of mass communications media in the Western sense. Diplomatic notes, speeches, trade, troop movements, cultural and scientific exchanges, and "spontaneous" popular demonstrations in the U.S.S.R. are conducted in a manner calculated to influence world public opinion.

The official news agency TASS serves as the main information channel with other countries in distributing information on the U.S.S.R. abroad and disseminating foreign news in the Soviet Union. A second news agency, *Agentstvo Pechati Novosti* (APN), also known as *Novosti*, supplements TASS' work. Official statements lay great stress on APN alleged independence as a "public" organization in contrast to TASS which is admittedly a government agency. In fact, however, APN is subject to the same propaganda controls as other elements of Soviet society. Radiobroadcasts of Soviet propaganda are beamed to foreign audiences primarily by the official *Radio Moscow* International Service and the regime's unofficial voice *Radio Peace and Progress*. In December 1970, the two services together accounted for approximately 1,897.5 hours' external broadcasting each week. A notable trend since 1958 has been the increase in Mandarin-language broadcasts to Communist China; in April 1970, the weekly total of such programs was roughly 168 hours, as compared with less than 20 hours in 1958.

Soviet foreign propaganda is also conducted covertly, appearing—without attribution to its Soviet origins—in publications of local Communist parties, "friendship" societies, and international front organizations. Soviet propaganda also finances publication of pro-Communist articles in foreign journals, clandestine support of strikes and popular demonstrations, and clandestine broadcasting as well as clandestine manipulation of foreign news media, both Communist and non-Communist.

Evaluation of the effectiveness of Soviet foreign propaganda is complicated by its close relationship to diplomatic activities, so that the problem frequently becomes one of assessment of the total impact of Soviet foreign policy. Another complicating factor is that much of the Soviet image abroad is created by Western reporting of Soviet developments, both successes and failures. As a rule, Soviet foreign propaganda has been most effective where it has essentially reflected the actual state of affairs or where it has conformed to and exploited existing attitudes and events.

3. Growing contacts with non-Communist world

In the years since Stalin's death in 1953, the Soviet people and particularly certain privileged groups have been allowed increasing contact with non-Communist countries. Foreign radiobroadcasts, tourism, and cultural and scientific exchanges have provided a gradually growing portion of the Soviet population with

less distorted information regarding the non-Communist world. Popular curiosity about life outside the Soviet Union and a desire to test the validity of official Soviet statements heighten the effectiveness of such contacts. Nevertheless, the Soviet people do not yet enjoy anything approaching open contact with peoples and cultures outside the Soviet Union and countries closely allied to it politically. The regime has regulated the expanded contact with foreigners; every Soviet citizen permitted to travel abroad is carefully screened by a department of the Party Central Committee, and foreign visitors to the U.S.S.R. are subject to fixed travel itineraries, close supervision, police surveillance, and even, occasionally, provocations. In areas where the West has been able to effectively penetrate information barriers the Soviet Government has responded vigorously with counterpropaganda.

Exposure to Western ideas and conditions nevertheless has had some impact on the Soviet people. Some citizens, particularly among the intellectuals and youth, show a questioning attitude toward the Soviet political and social institutions. Growing awareness of the disparity in consumer-goods production and housing between the Communist and non-Communist states has made it increasingly difficult for Soviet propagandists to impose extreme distortions of the truth and for the regime to ignore public demands for improved conditions.

H. Suggestions for further reading

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1. Political history—general works

Chamberlin, William Henry. *The Russian Revolution 1917-1921* (New York and London, MacMillan, 1952) Based on extensive research in Soviet archives and libraries. A readable and generally objective book that is still considered highly useful.

Clarkson, Jesse D. *A History of Russia* (New York, Random House, 1961) A general history, concentrating on the last four centuries but with generous space to the Soviet period. Useful also for its maps, illustrations, and chronological tables.

Sumner, Benedict H. *Short History of Russia* (New York, Harcourt Paperback, 1962) An examination of the persisting main tendencies in Russian history as seen by a distinguished historian.

Ulam, Adam B. *The Bolsheviks* (New York, MacMillan, 1965) A scholarly study of Lenin and his followers.

Venturi, Franco. *Roots of the Revolution* Translated from the Italian. (London, Weidenfeld and Nicolson, 1960) A thorough survey of the 19th century Russian revolutionary movements. Contains penetrating biographic studies of important Russian revolutionaries.

Vernadsky, George. *A History of Russia* (New Haven, Yale University Press, 1961) (5th revised edition) One of the most acclaimed introductions to Russian history by an eminent American scholar.

Wolfe, Bertram D. *Three Who Made a Revolution* (Boston, Beacon Press, 1962) (Dial Press, 1948) A study of Lenin, Trotsky, and Stalin before 1917.

2. Party and government

Armstrong, John A. *Soviet Bureaucratic Elite: A Case Study of the Ukrainian apparatus* (New York, Praeger 1967) An intensive study of administration of the Ukraine since 1930.

Armstrong, John A. *Ideology, Politics, and Government in the Soviet Union* (New York, Praeger, 1967) (revised edition) A good introductory study of the Soviet political system.

Barghoorn, Frederick C. *Soviet Russian Nationalism* (New York, Oxford, 1965) Investigates Soviet policy toward the minority nationalities in the U.S.S.R.

Brezinski, Zbigniew. *Ideology and Power in Soviet Politics* (New York, Praeger, 1962) Five essays by the author which analyze Tsarist, Bolshevik, and Soviet management of political affairs.

Brezhnev, Leonid I. *Collected Speeches and Writings* (Moscow, 1970) This is the first collection of Brezhnev's writings to be published in the Soviet Union. It includes speeches given by Brezhnev between 1964-70, avoiding the Khrushchev era.

Conquest, Robert. *Great Terror* (New York, MacMillan, 1968) A massive, scholarly, documented study of Stalin's Great Purge. Also provides much material on the changes in Soviet politics and society under Stalin. A bibliographical essay and appendices add value to this book.

———. *The Last Empire* (London, Ampersand, 1962) A study of Soviet expansion in central Asia and subsequent policy toward the minority nationalities there.

———. *Power and Policy in the U.S.S.R.* (London, MacMillan, 1961) An analysis of some of the major issues of Soviet internal policy under Stalin and during Khrushchev's ascendancy.

———. *The Soviet Deportation of Nationalities* (London, MacMillan, 1960) A brief account of the deportations of the various minority nationalities under Stalin, along with a larger section devoted to official Soviet pronouncements relevant to the deportations.

Crankshaw, Edward. *Khrushchev* (London, Collins, 1966) A biography, notable for its account of Khrushchev's career as a party bureaucrat.

Crowley, Edward L., et al (editorial) *Prominent Personalities in the U.S.S.R.* (Metuchen, New Jersey, The Scarecrow Press, Inc., 1968) A biographic directory containing 6,015 biographies of prominent personalities in the Soviet Union.

Dallin, Alexander, and Larson, Thomas B. (eds.). *Soviet Politics Since Khrushchev* (Englewood Cliffs, New Jersey, Prentice-Hall, 1968) A collection of essays outlining major post-1964 developments in both Soviet domestic and foreign policy.

Dzyuba, Ivan. *Internationalism or Russification* (London, Weidenfeld and Nicolson, 1968) An exhaustively documented study of the theory and the practice of the Soviet nationalities policy in the Ukraine. The author, a Ukrainian, wrote this book in 1965 and attempted to have it published in the Soviet

Union—which engendered trouble with the authorities. The book is written in Marxist-Leninist terms, but it nevertheless exposes Soviet ruthlessness.

Fainsod, Merle. *How Russia Is Ruled* (Cambridge, Harvard University Press, 1953) An authoritative study of the structure of the CPSU and the Soviet Government.

———. *Smolensk under Soviet Rule* (Cambridge, Harvard University Press, 1958) A masterly study based on the complete Smolensk Party files for 1917-38 which were captured by the Germans in Smolensk during World War II.

Hyland, William and Shryock, Richard W. *The Fall of Khrushchev* (Funk and Wagnalls, New York, 1968) A very readable account of foreign policy ventures as they entwined with internal struggles within the Kremlin to culminate in the downfall and shelving of party chairman Khrushchev.

Linden, Carl E. *Khrushchev and the Soviet Leadership, 1957-1964* (Baltimore, Johns Hopkins Press, 1966) Analytic survey of major issues debated during the Khrushchev era, focusing on sources of internal opposition that ultimately brought about the Soviet leader's ouster.

Pipes, Richard. *The Formation of the Soviet Union: Communism and Nationalism 1917-1923* (Cambridge, Harvard University Press, 1954) A detailed and scholarly study of early Bolshevik policy toward the minority nationalities in the U.S.S.R. Includes an excellent bibliography.

Shapiro, Leonard. *Communist Party of the Soviet Union* (New York, Random, 1960) A highly recommended comprehensive historical survey and analysis.

———. *Government and Politics of the Soviet Union* (New York, Random, 1965) (revised edition) A basic introduction to the structure of the party and government.

Swearer, Howard R. *The Politics of Succession in the U.S.S.R.* (New York, Little, Brown, 1964) The role of the party as a stabilizer in succession problems.

Tatu, Michael. *Power in the Kremlin* (London, Collins, 1969) Translated from the French. A detailed and perceptive study of the interplay of political forces and personalities in the Soviet leadership. Mr. Tatu served as Moscow correspondent of *Le Monde* from 1957 to 1964.

Ulam, Adam B. *New Face of Soviet Totalitarianism* (Cambridge, Harvard University Press, 1963) (reissued in paperback by Praeger, New York) Covers Stalin's role, the agricultural crisis since 1953, Sino-Soviet relations, and the CPSU 22d Congress. The author emphasizes the growing irrelevance of Marxist-Leninist ideas.

Uralov, Alexander (pen name of A. Avtorkhanov) *The Reign of Stalin* Translated from the French. (London, The Bodley Head, 1953) Stalinist policy toward the minority nationalities. The author was a member of the Communist Party from 1926 to 1937 and contributed to the *Soviet Encyclopedia*.

3. Foreign Policy

Dallin, David J. *Soviet Foreign Policy After Stalin* (Philadelphia, Lippincott, 1961) The Stalinist legacy inherited by his successors, the first period of transition, and the Khrushchev era are surveyed with a view toward establishing the variables and the constants in Soviet foreign policy after Stalin.

Gittings, John A. (ed.). *Survey of the Sino-Soviet Dispute: A Commentary and Extracts from the Recent Polemics, 1963-1967* (London, New York, Oxford University Press, 1968) Perhaps the best single compilation of major issues in the Sino-Soviet split, bringing into one volume extracts from all significant documents through the end of 1967.

Kennan, George F. *Soviet Foreign Policy 1917-41* (New York and London, Van Nostrand, 1960) A first-class introductory study which includes a documentary section that is useful for familiarization with the jargon of Marxist diplomacy from Lenin to Khrushchev.

Laqueur, Walter. *Struggle for the Middle East* (New York, Praeger, 1969) The latest in the author's series of works on Soviet policy in the Middle East, an analytical examination of the multiple factors at play in the Soviet involvement in the Arab-Israeli conflict.

Littell, Robert (ed.). *The Czech Black Book* (London, Pall Mall, 1969) Czechoslovakia's refutation of the Soviet White Book called *On Events in Czechoslovakia*, which set forth Soviet excuses for its invasion in 1968 and numerous accusations—political, military, ideological—against Czechoslovakia. The *Black Book*, which was prepared by the Czechoslovak Academy of Sciences, refutes the accusations point by point.

Mackintosh, J.M. *Strategy and Tactics of Soviet Foreign Policy* (London and New York, Praeger, 1962) A study of the influence of military thinking on Soviet foreign policy.

Ra'anan, Uri. *The U.S.S.R. Arms the Third World* (Cambridge, MIT Press, 1969) Employing as case studies the Soviet military aid programs in Indonesia and the United Arab Republic, presents a thought-provoking analysis of Soviet objectives and methods in the developing states.

Ulam, Adam B. *Expansion and Coexistence: History of Soviet Foreign Policy, 1917-1967* (New York, Praeger, 1968) The author, a professor of government at Harvard, is a leading American writer on Soviet developments. The treatment of the Cuban missile crisis is especially noteworthy.

Zimmerman, William A. *Soviet Perspectives On International Relations, 1956-1967* (Princeton, Princeton University Press, 1969) The best of recent published works utilizing "new" methodology; examines internal Soviet commentary on foreign problems as a reflection of changing attitudes among Soviet decisionmakers.

4. Defense

Bloomfield, Lincoln P., et. al. *Khrushchev and the Arms Race* (Cambridge, MIT Press, 1966) A study of the relationship between Soviet nuclear arms development

and Soviet foreign policy. Contains a careful chronological account of what was known about the real levels of Soviet nuclear delivery forces between 1954 and 1964. The book has much useful information but has been criticized for its far-reaching analysis of data that was not complete.

Brzezinski, Zbigniew (ed.). *Political Controls in the Soviet Army* (New York, Research Program on the U.S.S.R., 1954) A short but useful study of political indoctrination and surveillance in the Red Army.

Garthoff, Raymond L. *Soviet Strategy in the Nuclear Age* (New York, Praeger, 1958) An instructive work that discusses how the Soviet military has prepared intellectually as well as materially for every kind of warfare.

Kolkowitz, Roman. *Soviet Military and the Communist Party* (Princeton, Princeton University Press, 1967) A Rand Corporation Research Study. Traces the course of conflict between military and political leaders in the U.S.S.R. over such issues as political indoctrination in the ranks, one-man command, and responsibility for doctrinal innovation.

Larson, Thomas B. *Disarmament and Soviet Foreign Policy* (Englewood Cliffs, New Jersey, Prentice-Hall, 1969) Detailed and up-to-date analysis of the Soviet approach to disarmament, taking into account both limitations and opportunities provided by overall Soviet policy goals.

Sokolovsky, Marshal V.D. *Military Strategy: Soviet Doctrines and Concepts* (New York, Praeger, 1963) A collection of writings by 15 leading Soviet military theoreticians on strategy, relation of strategy to politics, problems of modern warfare, preparation for modern war, weapons development, and the armed forces. Dr. Raymond Garthoff has contributed an analytical introduction.

Wolfe, Thomas. *Soviet Strategy at the Crossroads* (New York, Harvard University Press, 1964) A wide-ranging but incisive examination of the strategic and doctrinal decisions that faced Soviet policymakers in the early 1960's, by an experienced and articulate observer.

5. Judicial system

Berman, Harold J., and Quigley, John B., Jr. (eds.). *Basic Laws on the Structure of the Soviet State* (Cambridge, Harvard University Press, 1969) A collection of basic Soviet laws defining the political structure of the Soviet state—legislative, administrative, and judicial aspects. Also includes the Rules of the Communist Party. Documents are presented as amended to 1 October 1968. The author, a professor of law at Harvard University, is a specialist on Soviet law.

Berman, Harold J. *Justice in the U.S.S.R.* (Cambridge, Harvard University Press, 1963) (revised and enlarged edition) An interpretation of Soviet law and its function in Soviet society by one of the leading American writers on Soviet legal institutions.

Conquest, Robert (ed.). *Justice and the Legal System in the U.S.S.R.* (New York, Praeger, London, The Bodley Head, 1968). A concise introduction to the

theory and practice of the law and the judicial system in the U.S.S.R. Part of the Bodley Head Soviet Studies series.

———. *Soviet Police System* (New York, Praeger, London, Bodley Head, 1968) A short, accurate history of the Soviet police system from 1917 to 1967. Although in need of updating, the book is an excellent introduction to the function and structure of the police system in the U.S.S.R. Also part of the Bodley Head series.

Grzybowski, Kazimierz. *Soviet Legal Institutions: Doctrines and Social Functions* (Ann Arbor, University of Michigan Press, 1962) The development of Soviet legal institutions from the Revolution to the early 1960's. Contains a good bibliography.

Kelsen, Hans. *The Communist Theory of Law* (New York, Praeger, 1955) A useful study, that analyzes the legal theories of Lenin, Stalin, Vyshinsky, and others. Describes the theory of international law set forth by Korovin and Krylov. Shows how Soviet lawyers must operate within the framework of Communist doctrine.

Litvinov, Pavel. *Demonstration at Pushkin Square* (Boston, Gambit Publishers, 1969) This book is one of the most significant pieces of dissident Soviet literature, partly because the author is the grandson of Maxim Litvinov, the Soviet foreign minister under Stalin. It is comprised of a series of notes concerning the 1967 trials of several demonstrators arrested in Moscow's Pushkin Square. They were protesting the arrest of another earlier group of Soviet dissidents who had compiled *The White Book*, a documentary record of the activities, trial, and imprisonment of Sinyavsky and Daniel, the young Soviet writers who had published material critical of the regime under the pen names Abram Tertz and Nikolai Arzhak.

Marchenko, Anatoly. *My Testimony* (New York, E.P. Dutton & Co., 1969) Translated from the Russian. A young Soviet worker's firsthand description of conditions in Soviet prisons and forced labor camps in the 1960's. The book is banned in the U.S.S.R., and the author is again in prison.

Morgan, Glenn G. *Soviet Administration of Legality—The Role of the Attorney General's Office* (Stanford, Stanford University Press, 1962) The history of the Soviet procuracy from 1922 to 1961, and debates in Soviet legal circles about the proper and constitutional functions of the procuracy.

Vyshinsky, Andrei Ya. (ed.). *The Law of the Soviet State*. Translated from the Russian. (New York and London, MacMillan, 1948) The official Soviet interpretation of the 1936 constitution and a documented analysis of the laws relating to the courts, elections, and citizen's rights and duties, by the former Soviet Public Prosecutor (later foreign minister).

6. Propaganda, intelligence, subversion

Barghoorn, Frederick C. *The Soviet Image of the United States: A Study in Distortion* (New York, Harcourt Brace, 1950) A valuable study of how the Soviet Union used news and propaganda before and during World War II to mold Russian opinion of the United States.

———. *Soviet Foreign Propaganda* (Princeton, Princeton University Press, 1964) A documented study of the propaganda themes and techniques exploited by the U.S.S.R. to influence the foreign policies of other countries.

Brumberg, Abraham. *In Quest of Justice* (New York, Praeger, 1969) A collection of political and literary directed writings from the Soviet Union.

Buzek, Antony. *How the Communist Press Works* (London, Pall Mall Press, 1964) An important work for a basic understanding of the press in the U.S.S.R. and the Communist countries of Eastern Europe. The author worked for the Czechoslovak News Agency for more than 10 years, holding responsible positions, before electing to make his home in the United Kingdom. He discusses the Marxist-Leninist imperatives for the press to act as an arm of propaganda and agitation, and describes how the press works in terms of editorial direction, education and attitudes of journalists, methods of circulation, organization of newspaper offices, the role of the Communist news agencies, means for insuring party control over publishing, and the evolution of the Soviet differentiated institution.

Dallin, David. J. *Soviet Espionage* (New Haven, Yale University Press, 1955) A chronological account of prewar and postwar Soviet espionage, its shifting objectives and main targets.

Inkeles, Alex. *Public Opinion in Soviet Russia*. (Cambridge, Harvard University Press, 1950) A study of Soviet propaganda for the masses through oral agitation, the press, radio, and film. Somewhat dated, but still to be recommended.

Kaznacheev, Aleksandr. *Inside a Soviet Embassy* (New York, Lippincott, 1962) The author, a former Soviet diplomat, was serving in the Soviet Embassy in Rangoon when he defected. His book is valuable for information about Soviet methods of intelligence gathering and subversion abroad, working through official Soviet missions.

Penkovskiy, Oleg. *The Penkovskiy Papers* (Garden City, New York, Doubleday, 1965) Colonel Penkovskiy, a senior officer in Soviet military intelligence, furnished Western intelligence services with information on Soviet high-level political and military planning from April 1961 to August 1962. His reports, collected and published in this book, provide much valuable information for an understanding of Soviet foreign policy under Khrushchev, as well as an intimate picture of the Soviet military and intelligence services.

Reisky de Dubnic, Vladimir. *Communist Propaganda Methods* (New York, Praeger, 1960) A case study of Czechoslovakia that focusses on the Communist Party's indoctrination of its membership and of the intelligentsia, 1949-58. A section is devoted to the Czechoslovak-Soviet Friendship League, and attention is given throughout the book to Soviet influence on the indoctrination and propaganda techniques used in Czechoslovakia during that country's most repressive era.

Rozenthal, M. and Yudin, P. (eds.). *The Short Philosophical Dictionary* (Moscow, 1939) (reissued in

1941, 1951-52, 1954) A basic reference for Soviet ideologists, newspaper editors, and propagandists.

Stillman, Edmund. *Bitter Harvest* (New York, Praeger, 1959) A collection of dissident writings from the Soviet Union and Eastern Europe.

Willoughby, Charles A. *Shanghai Conspiracy* (New York, Dutton, 1952) The Sorge spy ring. The book is based on data obtained from captured Japanese documents. Especially interesting for its account of the Comintern.

6. Economic

A. General

1. Introduction

The U.S.S.R. has the second most powerful economy in the world. During the 1960's, gross national product (GNP) grew by 60% and industrial production nearly doubled. A period of rapid growth during the 1950's was followed by a moderately lower rate of growth during the 1960's. Despite evidence in recent years of a general slowing in the pace of growth, the economy continues to expand, supporting rapid industrialization and maintenance of a strong military and scientific establishment—necessary features of the economy if the Soviet Union is to pursue its basic goals of maintaining national security and of spreading its dominance and eroding the influence of other world powers.

The Soviet Union's progress in industrialization and in building military strength has entailed a relentless enforcement of national economic priorities—an enforcement made possible by the fact that the U.S.S.R. has a "command economy." Major decisions are made by a small group of leaders at the top and are incorporated in annual and long-term economic plans prepared by central planning staffs. These plans cover all the important aspects of economic activity—output of major commodities, investment, military production, consumption, foreign trade, the labor force, and wages. Detailed directives and regulations are formulated by an elaborate and cumbersome bureaucratic apparatus that extends from the top oligarchy down to the individual factory, farm, and commercial enterprise. This system has resulted in rapid growth of the economy, but at heavy cost in terms of economic efficiency and of deprivation of the Soviet consumer.

Because of the ability to enforce economic priorities, the U.S.S.R., with a total output around one-half that of the United States, by 1968 was able to incur defense expenditures about three-fourths the size (measured in U.S. dollars) of those of the United States and to approach four-fifths of the U.S. level of annual investment. As a result of the relatively large allocations to defense and investment, the burden of these ambitious programs on the rank-and-file Soviet citizen continues to be heavy in terms of forgone consumption. On a per capita basis, GNP is 43% of that in the United States, but Soviet per capita consumption is only about one-third; even this comparison fails to take into account the narrow range of variety, the poor quality, and the scarcity of consumer goods in the U.S.S.R.

Despite the size of its investment programs and notable technical successes in military and space

applications, the U.S.S.R. lags well behind the United States in general production technology. Nevertheless, in the production of primary energy, certain foodstuffs, and heavy industrial goods, the gap in per capita output between the U.S.S.R. and the United States continues to close. Changes from 1960 to 1969 for a selected group of per capita indicators are shown in Figure 107.

2. Economic growth

Soviet GNP grew at an average annual rate of about 4% during the 2-year period 1968-69, well below the average annual rates during the 1950's and the early 1960's (Figure 108). Moreover, the growth rate for 1969 was only slightly more than 2%, reflecting declining growth rates in all major sectors of the economy—particularly in agriculture and industry. Contributing to the decline in growth rates since 1960 has been the problem of sharply diminishing returns on capital investment. That is, since 1960 increments of investment have been yielding steadily smaller additions of output. Solving this problem would necessitate a general—and unlikely—overhaul of the economy, for tinkering with organizational changes and investment flows is not likely to reverse the slowdown.

As a result of the slowdown in growth, the U.S.S.R. has made little progress in approaching the U.S. level of total output, despite a slight deceleration in the average annual rate of growth for the United States during the latter half of the 1960's. Soviet GNP, measured in 1969 dollars, had risen to 51% of U.S. GNP in 1969—from 46% in 1960—but the absolute difference in size widened by more than US\$100 billion (Figure 109).

Performance of the agricultural sector—which employs about one-third of the labor force and accounts for over one-fifth of the GNP—was a major determinant of the unsatisfactory growth of the Soviet economy in 1969. After reaching a record level in 1968, agricultural production fell 4.5% in 1969, with unfavorable weather the most important factor in the sharp decline. Moreover, the regime's failure to achieve the planned targets for investment in agriculture during the Five Year Plan for 1966-70 may have intensified agricultural problems. For example, deliveries of industrially produced inputs such as machinery and fertilizer to agriculture increased but remained below the targets projected by the Brezhnev-Kosygin regime in 1965.

The average annual rate of growth for industrial production also fell in 1968-69, dropping below the average annual rate recorded from 1960 to 1967. This drop was more directly the result of a decline in the growth of the efficiency with which labor and capital

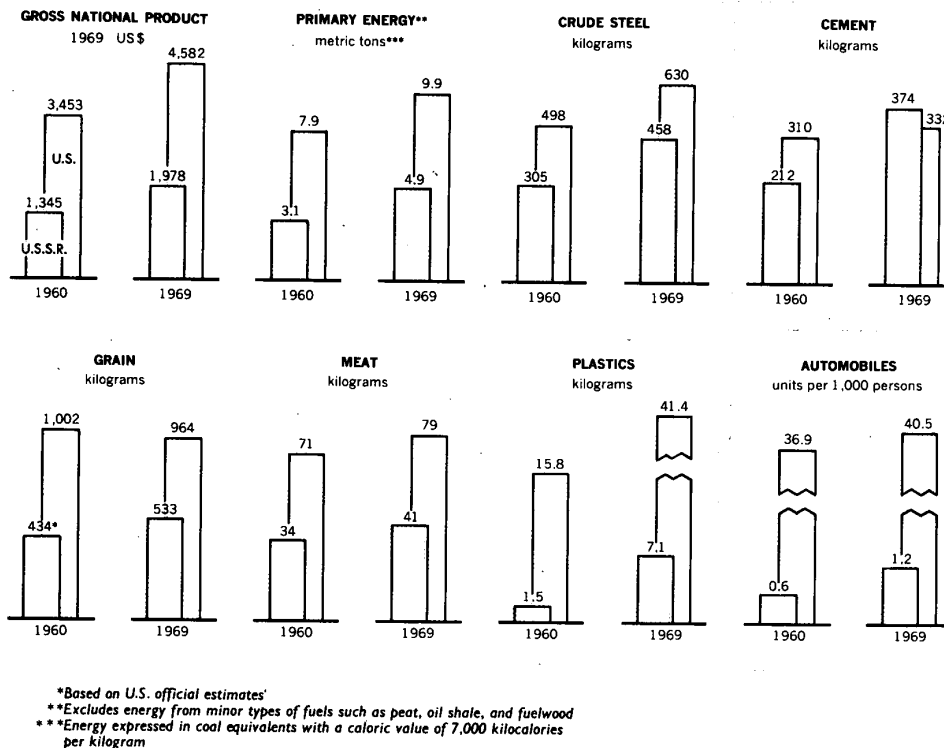


FIGURE 107. Selected indicators of per capita production in the U.S.S.R. and the United States

25X1

FIGURE 108. INDICATORS OF ECONOMIC GROWTH (U/OU)
(Percent per year)

	1951-60	1961-65	1966-67	1968-69
Gross national product (GNP)*	6.0	5.1	6.1	4.2
Agricultural Production Index**	3.8	3.4	4.6	0.4
Industrial Production Index*	9.6	6.7	7.6	6.2
Selected components of GNP by end use:				
Consumption	6.1	3.5	6.0	4.7
Defense	0.8	4.2	6.2	4.1
Gross fixed investment***	12.7	6.3	7.8	5.8
Agricultural investment***	11.8	11.9	8.1	8.0
Industrial investment***	11.1	7.3	5.2	5.9

*Based on U.S. official estimates of GNP at factor cost computed in ruble values.

**Based on U.S. official estimates of net agricultural production in ruble values (adjustment has been made to eliminate the double counting inherent in Soviet gross output data on such items as feed and seed).

***Based on official Soviet investment statistics expressed in ruble values.

were used than the slower rate of growth of inputs of labor and capital (Figure 110). The extremely severe winter and the drop in agricultural output also contributed to the decline in industrial growth. Productivity in industry grew by less than 1% annually during 1968-69, even slower than in 1961-65 when the sharp decline in productivity growth proved to be a major stimulus for the economic reform announced by Kosygin in 1965.

The declining average rates of growth of investment in agriculture and industry in 1966-67 forewarned of the

slower economic growth realized in the following 2-year period, 1968-69. The falling rate of growth of industrial investment impinged on the growth of industrial capacity not only through its effect on the volume of industrial fixed capital but also through its impact on the average level of technology embodied in that capital. Perhaps more importantly, previous Soviet economic policy, in trying to achieve the highest possible volume of investment, has forced the capital-output ratio continuously upward, a strategy that has accentuated the effect of diminishing returns. The

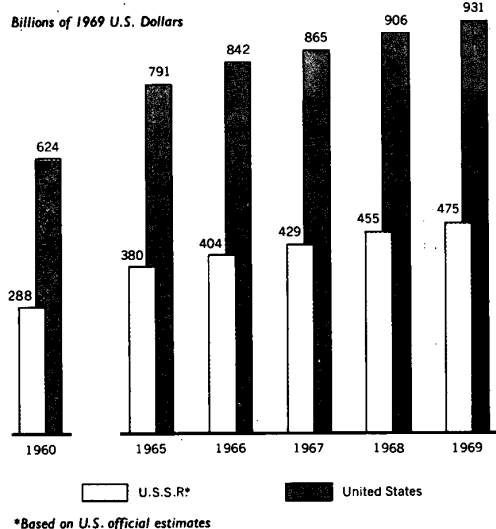


FIGURE 109. Comparison of the gross national product in the U.S.S.R. and the United States

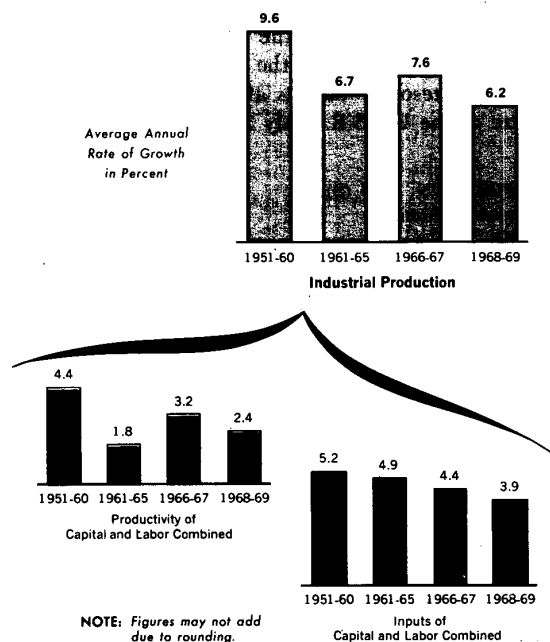


FIGURE 110. Factors affecting the growth of industrial production

maintenance of the average annual rate of growth in industrial investment in 1968 and 1969 at the same level as for the 2-year period 1966-67, therefore, is not likely to generate enough additional returns in the future to overcome the slowdown. In agriculture, previous rates of investment did not provide an agricultural resource base sufficient to insure a reasonably steady and

adequate expansion of agricultural output. The slight increase in the average annual rate of growth in agricultural investment effected in 1968 and 1969 is not likely to be enough to solve these problems and to make production less dependent on the vagaries of the weather.

3. Developments affecting economic organization (U/OU)

The vicissitudes of Soviet economic growth in the early 1960's caused the leadership to question increasingly the effectiveness of the system of economic planning and management instituted by Khrushchev and, in September 1965, to announce a program of economic reform. This occurred against a background of discussion and controversy among economists concerning economic incentives and success criteria affecting production. The discussions had evolved into two main schools of thought by the early 1960's—both advocating some form of institutional reform.

One group of mathematical economists, viewing economic problems as essentially technical in nature, advocated the use of "cybernetics" and "computerization" of the economy with little or no change in the underlying system of economic control. Another group, the so-called liberal economists (including many prominent mathematical economists), questioned the ability of the central authorities to plan and implement an efficient allocation of resources among the numerous enterprises and economic organizations of the economy. They therefore advocated greater decentralization of economic decisionmaking, with greater scope for enterprise managers to make operating decisions on the basis of profitability and sales indicators instead of the old criterion of gross value of output.

The 1965 reform measures swept away Khrushchev's regional economic councils (*sovmarkhozy*) and returned the administrative structure of planning and economic control to the ministerial system. Significant changes were made in the criteria to be used for judging the success of enterprise operations. The new criteria, designed to bring about greater efficiency in enterprise management, emphasize increasing the total value of sales (or total profit) and the rate of return on capital within the limitations imposed by product assortment directives. Enterprises that show progress under the new criteria retain a portion of their profits for bonuses to their employees, for productive investment, and for social purposes such as workers' housing. However, the basic power to allocate resources and to designate supplier-user relationships has been retained by the central planning organs. The reform thus constitutes a limited step toward giving enterprise managers 25X1, organize production more efficiently. Moreover, during the past several years, some of the main features of the reform have been gradually eroded by restrictions placed on enterprise managers. In the place of decentralization the regime has introduced organizational experimentation at a number of enterprises in the hope that the goals of the reform can be realized at less

25X1

cost to centralized control. The reform, in addition, does not eliminate basic flaws in the Soviet economic system such as the artificiality and arbitrary character of the price system and the lack of criteria necessary for the attainment of an economically efficient allocation of resources.

Furthermore, the positive aspects of the economic reform remain in the shadow of the administrative burdens of operating a centrally planned economy. As the economy continues to grow in size and complexity, the number of planned relationships and the problems of supply and distribution of raw materials, semimanufactures, and component parts among enterprises tend to increase alarmingly. The Soviets are well aware of these problems but do not appear to be anywhere close to an efficient solution. Increased computerization of the planning of production and distribution ultimately will help; but, in addition to the prickly theoretical problems inherent in such an effort, adequate computer hardware and software must be developed, statistical systems must be standardized, management must be trained in the new systems, and the whole complex must be "debugged," tested, and made operational. The regime has become aware of the importance of such an effort, and resources have been directed toward "computerizing" economic activity as a means of bringing about more effective implementation of the economic decisions of the leadership. The level of such resource allocations, however, has been inadequate. Significant progress can at best be slow, even if the effort escapes being bogged down in opposition from the entrenched bureaucracy.

4. Resource position

The basic wealth of the U.S.S.R. in land, labor, and capital helps to explain its dominant position among the Communist countries and its position as a world power second only to the United States. The U.S.S.R. is the largest country in the world in area and the third largest in population. As Figure 111 shows, the country has a high degree of self-sufficiency with respect to energy and a wide range of important raw materials and basic industrial products. Moreover, high levels of production of most important resources can be maintained for many years because the U.S.S.R. possesses about one-tenth of the world's waterpower resources, nearly one-fourth of the world's productive forests, and, it claims, some of the world's largest reserves of iron ore, chromite, lead, zinc, and nickel.

Despite its rich resource endowment, conditions for the exploitation of these resources are not always favorable. Most of the reserves of timber, coal, waterpower, and some metallic minerals are located great distances from the areas of consumption. Consequently, the Soviet extractive industries are generally high-cost industries, reflecting the high transportation charges incurred both in supplying and in shipping their products. The reserves of natural resources that can be economically exploited are further limited by the severity of the climate in some regions and the low quality of the mineral deposits. The agricultural resource base is also meager for a country the size of the U.S.S.R. Only 27% of the land mass is

FIGURE 111. STRATEGIC SUPPLY POSITION, 1969
(Thousands of metric tons unless otherwise indicated)

25X1

	PRODUCTION	IMPORTS	EXPORTS	APPARENT CONSUMPTION*	PRODUCTION AS A PERCENT OF APPARENT CONSUMPTION
Electric power (millions of kw.-hrs.)	689,000	0	3,939	685,061	100.6
Crude oil	328,000	0	63,888	264,112	124.2
Petroleum products**	230,000	1,128	26,912	204,216	112.6
Coal	608,000	7,200	23,299	591,901	102.7
Iron ore	186,000	0	33,071	152,929	121.6
Pig iron	81,600	48	4,692	76,956	106.0
Rolled ferrous metals	87,500	1,602	6,460	82,642	105.9
Copper, refined	1,078	0	107	971	111.0
Tin, primary	20	7	0	27	74.1
Aluminum***	1,500	2	423	1,079	139.0
Lumber (thousands of cubic meters)	†110,100	242	7,850	102,492	107.4
Cotton, ginned	1,941	170	452	1,659	117.0
Rubber††	785	328	58	1,055	74.4
Cement	89,800	378	2,959	87,219	103.0
Grain (millions of metric tons)†††	131.2	3.0	5.6	128.6	102.0

*Apparent consumption differs from actual consumption in that it does not take into account the stockpiling or the withdrawing from stockpiles of material goods.

**Including synthetic liquid fuel.

***The production figure is for primary aluminum only; the import and export figures include some rolled aluminum and duralumin.

†1968 production.

††All domestic production and exports consist of synthetic rubber; imports consist of both natural rubber and synthetic rubber.

†††Average for 1966-69. Because of large fluctuations in domestic production of grain and in imports and exports of grain from year to year, use of average annual quantities for several years provides a more reliable indication of the Soviet strategic supply position in grain than does use of the figures for a single year.

classified as usable agricultural land and only 11% as arable. Furthermore, compared with the United States, climatic conditions are poor for agriculture.

Soviet stocks of fixed capital used in production⁹ reached a total value of 380 billion rubles¹⁰ in 1969—more than double the 1960 level. Slightly more than one-half of this fixed capital was held by industry, while agriculture held a little more than one-fifth. Detailed comparison is not possible, but Western observers estimate the stock of fixed capital in the Soviet Union to be substantially below that in the United States. Moreover, by Western standards, much of the Soviet fixed capital is obsolescent.

The total Soviet labor force¹¹ (129.1 million persons in 1970) is about 50% larger than that of the United States. Not only is the population of the U.S.S.R. greater, but more than 50% of the Soviet population is in the labor force—a participation rate more than 10 percentage points higher than in the United States. The primary factor accounting for the higher Soviet participation rate is the higher incidence of women in the labor force. In 1969, for example, two-thirds of all women 16 years of age and older were in the Soviet labor force, compared with only two-fifths in the United States.

Reflecting the course of Soviet economic development, the structure of the labor force has undergone significant change since 1960. The share of the total civilian labor force employed in agriculture dropped from 50% in 1955 to 32% in 1969 as migration from rural to urban areas continued. Even so, the proportion of the Soviet civilian labor force engaged in agriculture in 1969 was seven times the corresponding proportion in the United States. A comparison of the distribution of civilian employment among agriculture, industry, transport, construction, and services in the two countries is shown in Figure 112.

As the share of the Soviet labor force in the nonagricultural sector increased from about 50% of the total in 1955 to 68% in 1969, important shifts occurred in the structure of nonagricultural employment. Until 1958, the growth of employment in industry had outstripped the expansion in other branches. However, in 1959-69, employment in the other branches (transport, communications, trade, and services) rose faster than in industry as the government tried to provide more of the services required by an increasingly urbanized population. The economic impact of these shifts in nonagricultural employment, however, was offset to some extent by a progressive reduction of about one-fifth in average annual worktime per employee.

⁹Including the value of basic herds and draft animals.

¹⁰Undepreciated value expressed in new rubles at 1955 prices. Under the Soviet currency reform of 1 January 1961, a new "heavy" ruble 10 times the value of the old one, was introduced. All ruble values in this section are in terms of new rubles. The official rate of exchange is 1 ruble = US\$1.11.

¹¹Total labor force includes the civilian labor force and the armed forces but excludes militarized security forces.

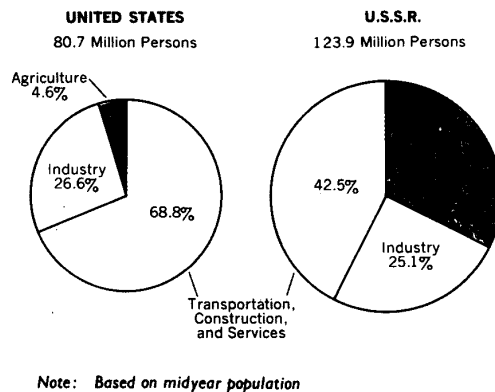


FIGURE 112. Distribution of the civilian labor force in the U.S.S.R. and the United States, 1969 25X1

The scheduled workweek contracted from 48 hours in 1955 to 41 hours in 1961, and paid vacations and maternity leave were lengthened.

The U.S.S.R. is thus endowed with substantial natural and human resources; its stock of fixed capital, although still far smaller than that of the United States, has grown rapidly. Institutional restraints, nevertheless, frequently impede attempts to bring about economically efficient use of the country's resources. Efforts have been made, for example, to substitute lower cost raw or synthetic materials for coal, metal, and wood. Such shifts have not been easy to accomplish, however, compared with similar shifts that occur automatically and continuously through the price mechanism in market-oriented economies. In some cases, the transition has taken longer than anticipated; in others, it has resulted in unscheduled dislocations in adjunct processes and industries; in still other cases, only token progress has been achieved because of a lack of sufficient quantities of the required skills, technology, and incentives.

5. International economic relations (25X1

Soviet foreign trade turnover (imports plus exports) was valued at nearly US\$22 billion in 1969, almost double the 1960 level. The \$22 billion in trade volume is small in comparison with Soviet GNP—about 5% in 1969—but the U.S.S.R. is among the leading trading countries, ranking eighth in the world. Because of its high degree of self-sufficiency in most physical resources, the U.S.S.R. carries on only a small amount of foreign trade in strategic goods; it is, however, entirely dependent on imports for natural rubber and relies heavily on imports of tin.

Soviet trade is largely oriented toward other Communist countries, but since 1960 the share of trade with the non-Communist world has risen from about one-fourth to about one-third. This rise in the share of the non-Communist world and the consequent decline in the Communist share resulted primarily from the

rapid growth in trade with the Industrial West,¹² although the decline in trade with Communist China also was an important factor.

In the 1960's the Soviet Union imported mostly machinery and equipment and manufactured consumer goods. Machinery and equipment—almost three-fourths of which originated in Communist Eastern Europe and most of the remainder in the Industrial West—was the largest single category of imports. Much of the Western equipment—purchased with scarce hard currency—embodied advanced technology (such as equipment for manufacturing synthetic fibers, plastics, and high-nutrient chemical fertilizers) not available in the Communist world and was designed to stimulate industrial growth. Equipment imports from Communist Eastern Europe were largely for lower priority industries that did not warrant the outlay of additional domestic resources (food processing equipment, papermaking equipment, and transportation equipment).

Soviet exports during the 1960's featured fuels, raw materials, and semifinished materials. Exports of machinery and equipment have increased, primarily going to other Communist countries and the less developed countries of the non-Communist world. Food exports have regained much of their former importance after a sharp decline in 1964-66.

The Soviet international payments position vis-a-vis the West deteriorated badly in the early and middle 1960's. Imports of machinery and equipment had been financed largely by gold sales since 1956, but the necessity for large-scale wheat imports in 1964-66 brought the hard currency deficit to US\$575 million in 1964. The use of hard currency for imports was restricted, and increased use was made of Western medium- and long-term credits. By 1967 the U.S.S.R. had ended the drain on its gold reserves (which had fallen to \$1.3 billion, about 40% of the 1955 level) and had a hard currency surplus of \$105 million. A deficit in 1968 of about \$100 million was financed without significant sales of gold, and the Soviet gold reserves had reached about \$1.4 billion by the end of 1968.

The Soviet economic aid program has been impressive in size. During 1945-69, the U.S.S.R. extended almost US\$12 billion in credits and grants to Communist countries,¹³ of which approximately \$10 billion has been drawn. During the initial years of the program, approximately \$1 billion in aid was extended, primarily to the Asian Communist countries, while in the mid-1950's the U.S.S.R. began to extend long-term economic development credits at low interest rates in an effort to stem disaffection among the Communist countries, especially in Eastern Europe. Cuba emerged as a Communist country in 1960 and since that time has

received about \$2.5 billion in Soviet aid, the largest amount extended to any Communist country. Bulgaria ranks second, having received commitments of \$2 billion, and Mongolia third with commitments of \$1.8 billion.

By the end of 1969 the U.S.S.R. had extended about US\$6.8 billion in economic assistance to less-developed non-Communist countries, of which about \$3 billion, or 45%, has been drawn. Although the average annual extension of new aid during the last half of the 1960's was higher than during the previous decade, the U.S.S.R. appears to have adopted a more conservative foreign aid policy during the past several years. Generally the Soviets have been more cautious in making new commitments and often have exacted harder repayment terms than before. Moreover, annual deliveries of foreign aid have shown virtually no growth since 1964. A more selective approach to new aid undertakings, intended to make the program a more effective political and economic instrument, has been reflected in the greater concentration of aid in a few countries—especially the Arab states and countries on the U.S.S.R.'s southern border. Four of these countries—India, the United Arab Republic, Afghanistan, and Iran—have accounted for 55% of total Soviet aid extended and more than 70% of the amount drawn.

B. Sectors of the economy

1. Agriculture, fisheries, and forestry

25X1

a. PROBLEMS AND POLICIES IN AGRICULTURE—A number of fundamental factors have contributed to making agriculture the traditional problem area of the economy. These factors include environmental restrictions due to a short growing season, low rainfall, and extremes of temperature; unwillingness of the Soviet leadership to commit a high level of industrially produced resources to agriculture on a continuing basis; insistence on the part of the regime on controlling and directing farm operations from above; and failure to provide adequate incentives to producers.

Developments in agriculture since the period when Khrushchev's policies were dominant (1954-64) are illustrative of how the fundamental problems of Soviet agriculture impinge on the production of food. In the period 1953-58 the substantially higher priority given to agricultural matters was reflected, in part, by increased allocations of machinery to farms and by many incentive measures—principally a sharp rise in real income—designed to induce the collective farm peasant to contribute a higher quality of labor service. In addition, Khrushchev's major innovations in land use—primarily the "new lands" campaign involving virgin and long-fallowed lands—had a favorable short-run impact. These policies, combined with favorable weather, led to an increase in farm output by nearly one-half and to an official atmosphere of euphoria concerning the possibility of continued high rates of growth.

¹²The Industrial West refers to Western Europe, Japan, North America, and Australia.

¹³This excludes aid extended to six countries of Eastern Europe during 1945-55. War reparations, privileged arrangements, and other impositions obtained by the U.S.S.R. from these countries created a heavy net flow toward the U.S.S.R. during this period.

But the failure or inability of the Khrushchev regime to sustain these policies after 1958 led to a drastic slowdown in the growth of farm output. Although urban incomes continued to rise, farm incomes stagnated. Machinery allocations declined, and there was a turn for the worse in Khrushchev's plan for expanding sown acreage. Continuous cropping in the new lands resulted in the deterioration of the structure of the soil, heavy infestation of weeds, a decline in fertility, and a depletion of soil moisture reserves. Hence, grain yields fell, and when severe droughts struck in 1963 and again in 1965 the basic deficiencies exacerbated by Khrushchev's post-1958 policies resulted in near-disastrous wheat harvests. In order to maintain a barely adequate level of food availabilities in these years, 11 million metric tons of grain had to be imported.

In March 1965 the new regime outlined its far-reaching program for stabilizing output and regaining the high growth rates of the 1954-58 period. The prescription, popularly termed the Brezhnev program, included higher prices to producers for major agricultural products, lower prices for nonagricultural goods sold to the farms, and—most important—a doubling of investment in agriculture compared with the period 1961-65. The new regime also proposed to reduce party interference in farming operations.

Steps were taken in 1965-66 to implement parts of the Brezhnev program. Those parts of the program that did not depend primarily on industrially produced goods for agriculture—such as plans for the use of improved cropping practices, for the introduction of a variety of incentives for farmers, and for the relaxation of restrictions on private agricultural activity—were put into effect. Implementation of these plans and an extended period of favorable weather led to increased agricultural output in 1966-68. Net agricultural production during this period was 22% above that of the last 3 years of Khrushchev's regime (1962-64), when production nearly stagnated. Success during this period and, perhaps, an enhanced priority to other resource claimants evidently led to a considerable weakening of the priority of the farm sector in the allocation of resources in 1967-69. After an initial spurt in the flow of industrially produced goods to farms during 1965-66, those parts of the program that required a sharp acceleration in the provision of industrially produced materials were permitted to lag far behind the original schedule. Although major cutbacks were made in 1967-69 from the original plan for deliveries of both investment goods (tractors, trucks, and agricultural machinery) and industrially produced materials (fertilizer, lubricants, electric power, and the like), even these new plans were not met, except in the case of fertilizer. In 1968, these failures were largely compensated for by relatively favorable weather, and a record level of farm output resulted. In 1969, however, the conjunction of unfavorable weather with failure to meet these revised plans led to a decrease in farm output to the 1967 level.

b. MAIN CHARACTERISTICS OF SOVIET AGRICULTURE

(1) *Land use*—The U.S.S.R. is the largest country in the world, claiming a total land area of 8.6 million square miles. About one-half of Europe and one-third of Asia lie within Soviet boundaries. The country is generously endowed with most types of natural resources, but it is handicapped in the exploitation of some of them by inaccessibility or inferior quality.

Although the total land area of the U.S.S.R. is impressive, the area suitable for cropping is relatively small—about 11% of the total land area (Land use inset, Summary Map, Figure 187). Another 16% of the land is classified as usable for other agricultural purposes, but because of low fertility or low precipitation its use is limited to permanent meadows and pastures. More than two-thirds of the land area is either covered with forest (34%) or deserts and wasteland (36%). Much of this wasteland, however, is suitable for grazing of livestock, ranging from pasturing of reindeer in the north to nomadic herding in the desert regions.

The bulk of natural resources is located in the immense and sparsely inhabited area known as the Regions East of the Urals.¹⁴ When it is realized that these basically inhospitable regions account for 75% of the total area of the U.S.S.R. but only about 25% of the population (Population inset, Summary Map, Figure 187), the problems that confront the Soviet Government in developing much of its natural wealth become more readily apparent.

The history of Soviet economic development to date has been largely the story of the European U.S.S.R. and the Urals, areas which are well enough endowed with natural resources to have permitted a high degree of self-sufficiency. Soviet leaders have realized, however, that vast, largely unexploited reserves of natural resources—of superior quality in many cases—are to be found in the Regions East of the Urals. As a result, numerous programs have been proposed to develop these regions. Invariably the cost has been too high to permit full implementation of the programs, with the result that plans for extensive capital development of the area have generally given way to further capital-intensive development of the European U.S.S.R. and the Urals.

(2) *Resource base*—The U.S.S.R., with more than double the land area of the United States, has an arable

¹⁴From the viewpoint of economic geography, the U.S.S.R. can be divided into the European and Urals Regions and Regions East of the Urals; the Ural Mountains serve as a rough dividing line. This division serves as a framework for Soviet planning of long-range economic development, the Regions East of the Urals being generally regarded as an underdeveloped area of the country (even though there are some important industrial centers there). The Regions East of the Urals comprise West Siberia (including Tyumenskaya Oblast'), East Siberia, the Far East, Kazakhstan, and Central Asia, as shown in Figure 113. The term "Eastern Regions," also used in Soviet statistics, includes the Urals Region, the Bashkirskaya A.S.S.R., and the Regions East of the Urals.

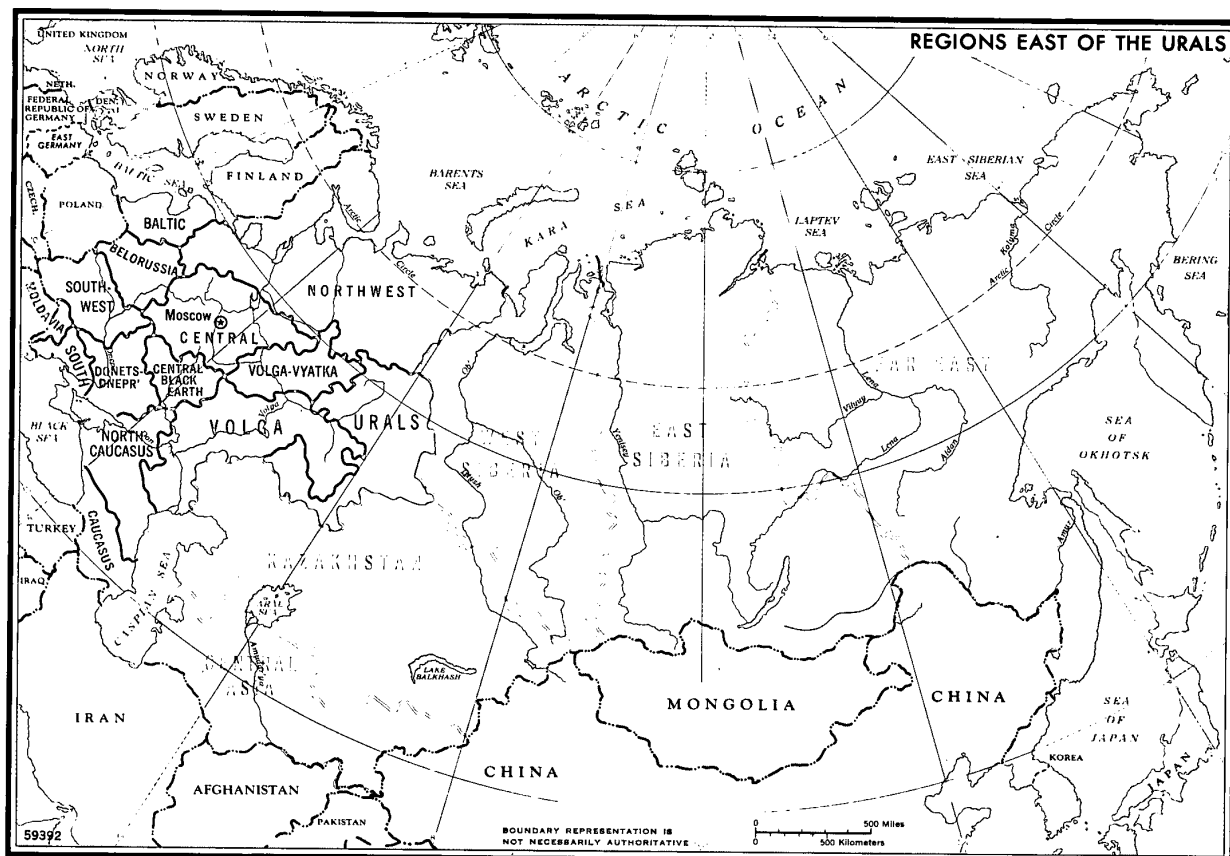


FIGURE 113. Economic regions of the U.S.S.R.

25X1

area only a third larger. Moreover, it has no areas that correspond to the most productive farm regions of the United States, and its agriculture is much less capital intensive. It has been attempting to attain crop production goals by expanding sown acreage while the United States has been reducing the area under cultivation and has been struggling with farm surpluses. In 1968, the sown area in the U.S.S.R. amounted to 511 million acres (207 million hectares), exceeding the 294 million acres (119 million hectares) seeded in the United States by 74%.

Harsh climatic conditions impose severe restrictions on Soviet agriculture. The basic environmental restrictions are low temperature and overmoist lands in the north and aridity in the south. In general, the continental character of the climate becomes more pronounced as one moves eastward on the great Russian plain, away from the moderating influence of the winds from the Atlantic Ocean. Even in the valuable "middle ground," or "fertile triangle," of Soviet agriculture extending from the Ukraine eastward nearly to Irkutsk the short growing season and the extremes of temperature limit the types of crops that can be grown. Areas devoted to the major types of farming are shown on the land use inset, Summary Map, Figure 187.

(3) *Farm organization*—Soviet agriculture is divided into a socialized sector and a private sector. The former consists primarily of state farms (*sovkhozy*) and collective farms (*kolkhozy*) and accounts for roughly two-thirds of the total agricultural output. The private sector consists of small private garden plots, one of the last remnants of legal private enterprise in the U.S.S.R. Small-scale private farming is carried on by roughly 30 million households, largely from the agricultural sector of the economy. Since all land in the U.S.S.R. is state owned, the basic difference between these types of organization lies in the ownership of assets other than land, in the method of capital formation, in the payment for labor, and in the marketing of agricultural produce.

During 1959-62 a large number of weak (unprofitable, in non-Communist terminology) collective farms were eliminated from the system by conversion to state farms; however, this practice was halted in 1962, and in 1964 the government initiated a program of long-term credits and direct subsidies aimed at improving the financial position of poor collective farms. During the period 1958-68 the number of state farms increased from 6,000 to 13,400, and the number of collective farms declined from 67,700 to 35,600—partly through amalgamation of the smaller collective farms and partly through conversion to state farms. The following

tabulation shows the shift that occurred in the distribution of sown area between and within the sectors of agriculture during these years, in millions of hectares and percent of total:

	1958		1968	
Socialized sector	188.3	96.2	200.2	96.7
State agriculture	56.9	29.1	97.9	47.3
State farms	52.4	26.8	89.2	43.1
Collective farms	131.4	67.1	102.3	49.4
Private sector	7.3	3.8	6.8	3.3
Total	195.6	100.0	207.0	100.0

Small-scale private farming in plots averaging less than half a hectare in size—always ideologically distasteful to the Soviet Government—has been tolerated for pragmatic reasons. The private plots, however, tend to compete with the socialized sector for the labor time of the farmers; consequently, there have been periodic attempts to decrease the importance of the private sector through discriminatory taxes and reductions in the size of plots and the number of animals permitted. As would be expected from the small size of holdings allocated to households, production activity in the private sector concentrates on those crops and livestock products that provide a relatively high value of output per unit of land. In 1968, private farming supplied 62% of the potatoes, 41% of the vegetables, 34% of the fruit, 60% of the eggs, and 38% of the milk and meat produced in the U.S.S.R. The relatively large share of total crop output accounted for by the private sector—about one-fourth—is grown on an area somewhat less than 4% of the sown area for the country as a whole. In addition, the private sector is able to obtain access to certain land that is controlled by the socialized sector for purposes of pasturing privately owned livestock and harvesting hay. If the area in the socialized sector that directly or indirectly produces feedstuffs for the private sector is added to the relatively small area directly held by households, the total area given over to supporting private farming comes to roughly 23% of the country's arable land.

(4) *Major farm programs*—Numerous measures have been applied to agriculture—with varying degrees of success—since the death of Stalin in 1953 in an effort to make it more responsive to the needs of the growing economy. The “new lands” program added about 42 million hectares to the sown area between 1954 and 1960. Between 1954 and 1962 the corn program contributed substantially to the forage supply, but the decline in area sown to corn since Khrushchev's fall indicates a more rational approach by the subsequent leadership to the role of corn in Soviet grain production. In 1957, efforts to spur the output of livestock products included the launching of the “catch-up” campaign—which foundered because the goals were unrealistic—designed to permit the U.S.S.R. to overtake the United States in per capita production of milk in 1958 and of meat in 1960 or 1961.

When Brezhnev and Kosygin assumed control in late 1964, they were confronted with near stagnation of

agricultural production in the face of steadily rising demand for farm products. The Brezhnev program, therefore, included a long list of remedial measures with a number of provisions for expanding the production base of the farm sector during the period 1966-70. These measures were highlighted by targets requiring a doubling of deliveries to farms of new machinery and equipment and soil additives (fertilizer and lime) in 1966-70 in comparison with 1961-65. In 1967-69, major cutbacks from the original plan were made, but, except in the case of fertilizer, these new plans were not met. The Brezhnev program also called for a major boost in investment in land reclamation, scheduled to result in an expansion of nearly 30% in the stock of irrigated and drained land by 1970. Investment in land reclamation proceeded at a somewhat brisker pace than other parts of the investment program; however, because of the increased abandonment of previously reclaimed land, the net area reclaimed has not yet increased appreciably. In addition, attempts to achieve short-run increases in output included temporarily encouraging production in the private sector and modifying the former policy of specialization of livestock production on collective and state farms. Specialization—an attempt to make livestock raising more productive—resulted in a sharp decline in the number of collective and state farms with livestock holdings and thereby decreased the flow of young stock to the private sector.

Under the Brezhnev program, deliveries of tractors and agricultural machinery during 1966-70 were scheduled to be nearly two-thirds above the deliveries for 1961-65, but plans have not been met. The shortfall in investment in agricultural machinery and equipment means slower growth in inventories of farm machinery. However, by concentrating on a small number of objectives, the U.S.S.R. has achieved a fairly high level of mechanization in such basic field operations as the plowing, seeding, cultivating, and harvesting of grain crops. In most other operations, particularly in animal husbandry, the level of mechanization remains low. Deliveries of equipment in agriculture have followed an erratic pattern and have not always coincided with the needs of agriculture; however, inventories increased substantially between January 1954 and January 1969, as the following tabulation (in thousands of units) shows:

	1954	1969
Tractors	744	1,821
Trucks	424	1,097
Grain combines	318	581
Ensilage combines	2.4	138
Beet combines	4	59
Potato combines	0.5	28
Tractor plows	668	918
Tractor cultivators	559	1,138
Tractor drills	644	1,280
Windrowers	3	362

One of the major factors contributing to the inefficient utilization of equipment and the consequent high costs of production in Soviet agriculture is the poor

state of repair work. Spare parts are in short supply, high priced, and often of poor quality. Although some improvement has occurred since 1965, production of spare parts is roughly 30% below the scheduled amount. Efficient, reasonably priced, and good-quality repairs—as envisaged in the Brezhnev program—are still not commonplace in Soviet agriculture.

Brezhnev's program called for a large expansion in the use of fertilizer and lime as a means of boosting crop yields. Annual deliveries of fertilizer to agriculture were to reach 55 million metric tons by 1970—less than the 70 million to 80 million metric tons envisioned by Khrushchev, yet double the 1965 level. By 1969, annual deliveries of mineral fertilizer to agriculture neared 39 million metric tons. Moreover, the addition of 11 million tons of new fertilizer capacity in 1969 indicated marked progress. Although this addition to capacity was below the planned 13 million-ton increase, it was more than twice the new capacity added in 1968 and more than three times that added in either 1966 or 1967. The new plan also called for the liming of nearly 30 million hectares of croplands during 1966-70, a goal that would require doubling output of lime for agricultural purposes by 1970. In addition, the application of chemical pesticides and herbicides was scheduled to be stepped up in an effort to save some of that portion of the Soviet harvests normally lost because of insects, diseases, and weeds, but production has been running below the planned level.

(5) *Crops*—The U.S.S.R. grows most crops common to the temperate zone, but grains, which accounted for 59% of the total sown area in 1968, dominate the pattern. In the same year, forage crops accounted for 29% of the total sown area, industrial crops for 7%, and potatoes and other vegetables for 5% (Figure 114). The total crop area in the U.S.S.R. has expanded significantly since 1950, with most of this expansion being attributable to the “new lands” program. In 1950-63, a drastic reduction of clean fallowing—from 32.0 million hectares to 6.3 million hectares—aided this expansion, but by 1968 the area in clean fallow increased to 18 million hectares. (In clean fallowing, the land is not planted and is cultivated only as needed to prevent growth of weeds; this permits

moisture accumulation in the soil.) The distribution of area in major grain crops (including pulses) for 1953 and 1969 is shown in the following tabulation, in percent of total:

	1953	1969*
Bread grains:		
Wheat	45.3	54.1
Rye	19.0	7.5
Total	64.3	61.6
Feed grains:		
Barley	9.0	18.3
Corn	3.3	3.4
Miscellaneous**	23.4	16.7
Total	35.7	38.4
Total grains	100.0	100.0

*Preliminary estimates.

**Primarily includes pulses (beans, peas, lentils), oats, millet, and buckwheat.

Although the area sown to grain is greater than in the United States, the average yield per hectare in the U.S.S.R. is much less; also, the total production of grain is significantly lower (Figure 115). In addition, Soviet grain production is subject to marked fluctuations. The 1958 level was not reattained until 1964 and not surpassed until the record harvest of 1966. Moreover, in 1963 and 1965 there were near-disastrous harvests caused primarily by severe drought. The bumper grain harvest in 1968 ranked second only to the 1966 level of production, but the 1969 grain crop was below both the 1968 level and the average level achieved in 1966-68. The 1969 decline was largely the result of unfavorable weather conditions which caused above-normal damage to winter grain and to other fall-sown crops, prevented timely spring planting, and compressed the time available for fall harvesting. Data for the average annual production and yields of principal crops are shown in Figure 116.

Next to wheat and rye, potatoes constitute the most important Soviet food crop, especially in the western and central regions of the European U.S.S.R. The area planted to potatoes during 1955-60 varied between 8.9 million and 9.7 million hectares; since 1960, however,

FIGURE 114. SOWN AREA, BY CROP
(Millions of hectares)

	1950		1955		1960		1965		1968	
	Total area	Percent*	Total area	Percent*	Total area	Percent*	Total area	Percent*	Total area	Percent*
Grain (including pulses).....	102.9	70.3	123.5	66.4	115.5	56.9	128.0	61.2	121.5	58.7
Industrial crops**.....	12.2	8.4	12.3	6.6	13.0	6.4	15.3	7.3	14.6	7.0
Potatoes and other vegetables.....	10.5	7.1	11.4	6.2	11.2	5.5	10.6	5.0	10.2	4.9
Forage crops.....	20.7	14.2	38.7	20.8	63.2	31.1	55.2	26.4	60.7	29.3
Total.....	146.3	100.0	185.9	100.0	202.9	99.9	209.1	99.9	207.0	99.9

*Based on unrounded data.

**Includes food crops (primarily sugar beets and sunflower seed) and nonfood crops (primarily cotton, fiber flax, and hemp).

25X1

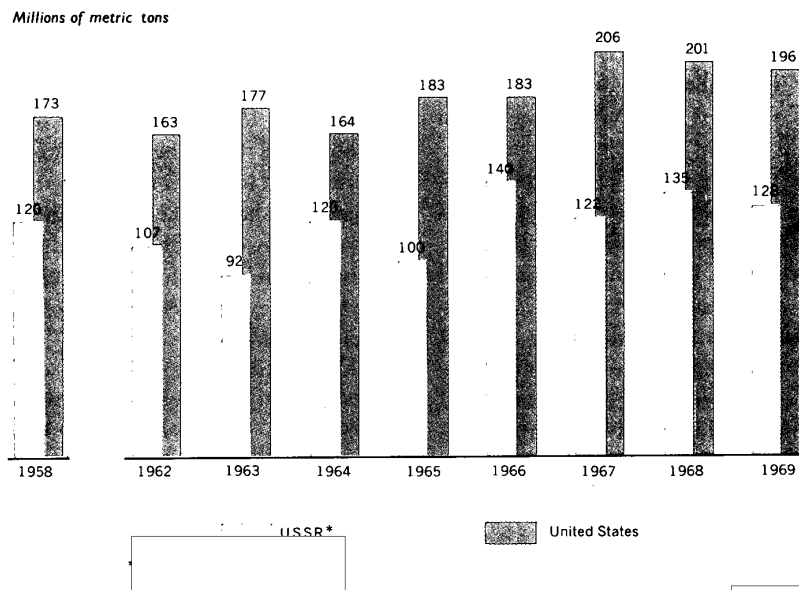


FIGURE 115. Production of grain in the U.S.S.R. and the United States

25X1

25X1

FIGURE 116. AVERAGE ANNUAL PRODUCTION AND YIELDS OF PRINCIPAL CROPS (U/OU)

	1953-55	1958-60	1964-66	1967-69
----- Millions of metric tons -----				
Production:*				
Total grain and pulses.....	89.5	102.6	120	128.3
Breadgrain (wheat and rye).....	59.2	70.1	75	77
Coarse grain (barley, corn, and oats).....	25.9	27.9	44	50.3
Sugar beets.....	24.7	52	75.8	84
Sunflower seed.....	2.8	3.6	5.4	6
Potatoes.....	73.1	85.8	90.1	96.3
Other.....	12.5	15.4	18.3	19
----- Quintals per hectare -----				
Yields:**				
Total grain and pulses.....	7.8	8.6	9.3	10.5
Breadgrain.....	8.1	8.7	8.9	9.8
Coarse grain.....	8.6	9.7	15.1	15.7
Sugar beets.....	149.3	189.3	186.3	234.2
Sunflower seed.....	6.8	8.9	11.7	12.4
Potatoes.....	84	91.3	106.1	116.8
Other.....	87.3	104.7	125.9	134.2

*Figures for grain crops and sunflower seed for 1958 and later are U.S. official estimates; all other production data are given as officially reported by the U.S.S.R.

**Yields are based on official Soviet data on the sown area for the respective crops.

the area has been falling and in 1969 fell to 8.1 million hectares, below the 1950 level of 8.5 million hectares. Although yields have increased moderately, the average annual production of potatoes in 1960-69 was less than 9% greater than the 1950-59 average.

The principal industrial food crops in Soviet agriculture are sunflower seed and sugar beets. (The principal industrial nonfood crops—cotton and fiber flax—are treated below under Natural fibers.) Of the 14.6 million hectares sown to industrial crops in 1969, sunflower seed claimed about 33% and sugar beets

(exclusive of sugar beets sown for livestock feed) claimed about 24%. Oil from sunflower seed is the basic edible vegetable oil used in the U.S.S.R., accounting for roughly three-fourths of the vegetable oil produced in state industrial enterprises. Hardy and drought resistant, the sunflower plant is well suited to the Soviet climate, especially in the southern regions of the European U.S.S.R. During 1950-63, the area planted to sunflowers fluctuated between 3.6 million and 4.5 million hectares. Since 1963, however, the acreage expanded rapidly, reaching a peak of 5 million hectares

in 1966 and declining only slightly since then. Production of sunflower seeds has increased more rapidly than the area planted to sunflowers. The increase in yields is attributable in part to the development of new varieties that have a higher oil content.

The U.S.S.R. is the leading producer of sugar beets, producing more than one-third of the world output—about four to five times as much as the United States, the second largest producer. Production has increased significantly, largely as a result of expansion in sown area. While a decline in production during 1961-63 reflected declining yields that more than offset the effect of increases in sown area, the downward movement in production was reversed in the 1964 crop year, and production has since been maintained at relatively high levels. Nevertheless, yields did not reattain the 1958 level until 1967.

(6) *Livestock and livestock food products*—The U.S.S.R. did not regain the precollectivization levels of 1928 until 1953 for swine, 1954 for sheep and goats, 1958 for all cattle, and 1959 for cows. As for horses, the number has been declining since 1928 as mechanization has gradually reduced dependence on horses for farm draft power. The number of donkeys, mules, and camels has also declined since 1928. Numbers of livestock for selected years are shown in Figure 117.

Increases in livestock numbers after 1950 were often made irrationally, without regard to the number of animals that could be properly maintained with the available supply of feed. The total supply of feed (in standard feed units of one ton of oat grain), which averaged an estimated 200 million metric tons per year in 1959-62, declined to less than 180 million metric tons in 1963 and 1964. This decline in feed supplies necessitated the forced slaughter of livestock in 1963. Based on the relatively good harvests of subsequent years, feed supplies expanded, reaching a peak in 1968, when the supply of available feed units was one-fourth

greater than in 1964. Total livestock herds also increased moderately during this period, achieving a peak level in 1967. Since that time, the total number of livestock has declined, partly as a result of the severe winter in 1969 followed by the late spring which contributed to a smaller carryover of feed units per animal and to higher rates of mortality among livestock, especially sheep. The decline in livestock numbers was also partly a result of the drop in the number of privately held livestock, a development largely caused by the policy of specialization of livestock raising in the socialized sector.

Estimated total production of basic livestock food products in the U.S.S.R. is shown in Figure 118.¹⁵ (Wool, an important livestock nonfood product, is treated below under Natural fibers.) The greatest increases in such production occurred between 1950 and 1960. During 1960-64, the production of meat and milk increased at more moderate rates. After 1964, temporary improvements in the available feed supply provided the basis for more rapid increases in the production of meat and milk, but, although yields of meat and milk per head of livestock increased, they remained far below Western standards. In 1968, production of major livestock products stagnated, and, in 1969, the output of meat and milk declined. The decline in meat production reflected not only the decrease in livestock numbers but also the adoption of a policy of expanding depleted herds by forgoing slaughtering in 1969.

(7) *Natural fibers*—The most important natural fibers in the U.S.S.R. are cotton, flax, and wool. As shown in the following tabulation, domestic production supplies nearly all of the country's apparent

¹⁵Because a large portion of Soviet livestock is privately owned, verification of Soviet statistics, especially for the production of meat and milk, is difficult. An attempt has been made, however, to make the statistics conform to U.S. definitions of the products. Information on the output of meat, milk, and other food products processed in state industrial enterprises is presented in the discussion of food processing.

FIGURE 117. NUMBERS OF LIVESTOCK (Millions)

YEAR*	CATTLE (INCLUDING COWS)		SWINE	SHEEP AND GOATS		TOTAL	HORSES
		COWS					
1928**	66.8	33.2	27.7	114.6	209.1	36.1	
1950	58.1	24.6	22.2	93.6	173.9	12.7	
1958	66.8	31.4	44.3	130.1	241.2	11.9	
1963	87.0	38.0	70.0	146.4	303.4	9.1	
1964	85.4	38.3	40.9	139.6	265.9	8.5	
1966	93.4	40.1	59.6	135.3	288.3	8.0	
1967	97.1	41.2	58.0	141.0	296.1	8.0	
1968	97.2	41.6	50.9	144.0	292.1	8.0	
1969	95.7	41.2	49.0	146.1	290.8	na	
1970	95.2	40.5	56.0	135.7	286.9	na	

na Data not available.

*Census date is 1 January.

**Present boundaries.

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FIGURE 118. OUTPUT OF PRINCIPAL FOOD PRODUCTS
(Millions of metric tons unless otherwise indicated)

	1950	1960	1964	1965	1968	1969
Livestock products:*						
Meat**	4.4	7.4	7.3	8.8	10.2	9.8
Whole milk	31.8	55.5	59.5	68.2	77.2	76.7
Eggs (billions of units)	11.7	27.5	26.7	29.1	35.7	37.0
Fish catch (including marine animals)	1.7	3.5	5.2	5.8	6.7	7.3
Output of food industry:***						
Meat	1.6	4.4	4.1	†5.2	6.6	6.4
Beef	1.0	2.0	2.2	2.4	3.5	na
Pork	0.3	1.4	1.0	1.8	1.9	na
Mutton	0.2	0.4	0.4	0.4	0.4	na
Poultry	Insig	0.2	0.1	0.2	0.2	na
Other	0.1	0.5	0.4	0.5	0.6	na
Milk products	1.1	8.3	10.5	11.7	16.4	18.2
Butter	0.3	0.7	0.8	1.1	1.0	1.0
Cheese	0.1	0.2	0.3	0.3	0.4	0.4
Sugar (granulated)	2.5	6.4	8.2	11.0	10.8	10.3
Vegetable oil	0.8	1.6	2.2	2.8	3.1	3.0
Margarine and margarine compounds	0.2	0.4	0.6	0.7	0.7	na
Canned foods (billions of cans)††	1.5	4.9	7.5	7.1	9.5	9.6
Flour	22.0	35.0	34.0	37.0	39.0	na
Bread and bakery products	12.4	15.5	20.4	19.7	19.0	na
Macaroni products	0.4	1.0	1.3	1.3	1.1	na
Beer (millions of decaliters)	130.8	249.8	283.0	316.9	383.0	na

*The figures for meat and milk have been derived by adjusting official Soviet data to reflect more accurately the amounts actually produced.

**Slaughter weight.

***The sugar and margarine series cover total production. The milk products series is equivalent to state purchases of milk. The butter and vegetable oil series exclude household production. The meat and cheese series exclude household and collective farm production. The bread and bakery products series excludes household, collective farm, and industrial cooperative production. The scope of the remaining series is not defined.

†Figures may not add to totals because of rounding.

††400-gram or 353-cc. cans.

consumption of these fibers (1968 data, in thousands of metric tons):

	GINNED COTTON	FLAX FIBER	WOOL (WASHED)
Production	2,022	400	207
Imports	137	0	71
Total availability	2,159	400	278
Exports	554	8	26
Apparent consumption	1,605	392	252

Even though the U.S.S.R. does not carry on a large volume of foreign trade in these fibers relative to domestic production, imports of cotton and wool provide higher grades of fibers than are generally produced at home. Soviet exports of natural fibers go predominantly to the Eastern European Communist countries, and some of the cotton shipped to these countries returns in the form of finished cotton goods.

Cotton is the leading fiber crop and principal irrigated crop in the U.S.S.R., production being second only to that of the United States. The 60% expansion in production of cotton from 1950 to 1969 was due to a variety of factors: increases in the irrigated area sown to cotton, increases in the application of fertilizer, increased price incentives, and improved production practices. However, production remains subject to vagaries of the weather and sporadic shortages of irrigation water.

The U.S.S.R. is the world's largest producer of flax fiber; its share of total world output has averaged 65% in recent years. The area planted to flax fiber declined from 1.7 million hectares in 1962 to 1.3 million hectares in 1969, while production rose from 432 million to 450 million metric tons.

Although wool-producing is important, the quality of much of the product is inferior. While production of wool in 1968 was 15% above the 1961-65 level, it was still inadequate to meet the requirements of the wool textile industry. Preliminary estimates indicate that 1969 production was about 6% below the 1968 record level, due to the long, harsh winter which increased mortality rates for sheep on open range as well as under shelter.

c. FISHERIES—Boasting a large and modern fishing fleet, the U.S.S.R. ranks among the top fishing nations of the world. In 1968, the latest year for which detailed statistics are available, it accounted for 9.5% of the world's fish catch and about 11% of the world's whale catch (in the 1967/68 season). Increased interest in fishing has been related to a growing dependence on fish products as a source of animal protein in the Soviet diet. In 1969, consumption of fish reached 14 kilograms per capita, compared with 8.9 kilograms per capita in 1959. Moreover, the U.S.S.R. has become a net exporter of fish and fish products, although exports still represent a small percentage of the total fish catch.

In 1969 the total Soviet catch of fish and marine animals amounted to 7.3 million metric tons (Figure 118). The rapid growth of the catch, which has more than doubled since 1960, has resulted primarily from the expansion of fishing on the high seas;¹⁶ this portion of the catch rose from 65% of the total in 1960 to 76% in 1967.

In 1968, about 3.8 million metric tons of fish and fish products (about 57% of the live-weight catch) were utilized. Of this amount, roughly 87% consisted of edible fish products sold in fresh, frozen, salted or pickled, or canned form. Production of canned fish increased from 200 million cans (71,000 metric tons) in 1950 to 1,125 million cans (397,700 metric tons) in 1968. The utilization of the catch is tabulated as follows, in thousands of metric tons:

	1958	1965	1968
Edible fish products:			
Canned	214.1	348.3	379.7
Live, chilled, frozen	651.0	1,578.1	1,951.5
Smoked, dried*	75.7	185.5	288.6
Salted	371.0	229.2	229.6
Salted herring	460.0	543.4	429.9
Other (residual)	25.0	0.6	0
Total edible fish products	1,796.8	2,885.1	3,279.3
Other fish products**	120.1	398.2	503.9

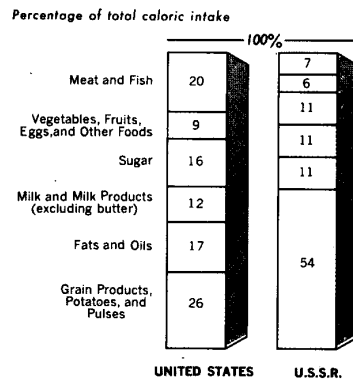
*Includes spiced and marinated herring.

**Includes whale oil, sperm oil, fish body oils, whale meal, and fishmeal and solubles.

d. ADEQUACY OF FOOD SUPPLY AND DIET—Except in years of severe crop failure, agriculture provides sufficient calories for the Soviet population. During the past decade the Soviets have had a sufficient quantity of food to provide a daily caloric intake per capita within the range of 3,000 to 3,200 calories. Since the early 1950's, the diet has experienced a marked improvement in quality—that is, in the increased availability of meat, milk, fish, and vegetables. Nevertheless, the average Soviet diet remains high in starchy foods. In 1968, about 54% of the daily caloric intake was derived from cereal products, potatoes, and pulses, compared with 26% in the United States (Figure 119). The decline in the output of livestock products in 1969 (discussed above under Livestock and livestock food products) has had a moderately adverse effect on the Soviet diet, at least temporarily. Per capita consumption of meat declined 4% during that year. Furthermore, the absence of any sizable area in the U.S.S.R. suited to winter production of fruit and vegetables and the shortage of refrigeration and rapid transport facilities impose a monotonous diet on most of the population during a large part of the year.

In part because of the problems besetting Soviet agriculture, and in part because of vagaries of the weather, crop production fluctuates widely and some food must be imported. For example, grain was

¹⁶High seas refers to oceanic fishing areas excluding the Black, Caspian, Azov, and Aral Seas.



Note: Calories per day estimated at 3,200 for the U.S.S.R. and 3,250 for the United States.

FIGURE 119. Comparison of average diets in the U.S.S.R. and the United States, 1968

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imported after the poor harvests in 1963 and 1965; in 1969, weather conditions led to the importation of not only grain but also considerable amounts of meat. The uncertainty in the food supply, the expectations of the population for a better quality diet, and the low productivity of agriculture are matters of serious and continuing concern to the leadership. The food supply is obtained at relatively high economic cost. Agriculture engages almost one-third of the civilian work force in supplying about one-fifth of the national product.

e. FOREST RESOURCES AND PRIMARY FOREST PRODUCTS—Forests cover approximately 747 million hectares or about one-third of the total land area of the U.S.S.R. Nearly one-fourth of the world's productive forest land capable of producing crops of industrial wood and about one-half of the coniferous portion of the world's productive forests lie within Soviet boundaries.

Despite the enormous volume of standing timber and the fact that the U.S.S.R. produces more timber and lumber than any other country in the world (total log removals in 1968 amounted to 380.4 million cubic meters), the country has not been able to satisfy the combined needs for home consumption and export. This failure results in part from the unfavorable geographic location of the forests in relation to centers of wood consumption (three-fourths of the Soviet Union's forest resources, for example, are located in Siberia and the Far East). The movement of wood products has imposed a considerable and increasing burden on the transportation system. As a result of the relocation of the logging industry to more remote areas during the 1950's, the average length of haul per ton of wood shipped by rail increased from about 1,000 kilometers in 1950 to about 1,560 kilometers in 1968, the highest average for any commodity moved by rail.

Net exports of wood and wood products have risen steadily since 1955, and by 1968 they totaled about 12.8 million cubic meters of logs and 8.0 million cubic meters of lumber. Although wood exports make an important

contribution toward improving the Soviet balance of payments, Soviet lumber exports remain small compared with domestic production. A substantial increase in exports of timber is scheduled during the 5-year period 1969-73 in payment for the technical assistance Japan is rendering to the Soviet timber industry in Primorskiy Kray.

2. Fuels and power

The rapid development of sources of energy, mostly for industrial use, has been a primary objective of the Soviet Government. Because of the country's large resources of mineral fuels and waterpower—reserves that exceed those of either the United States or Western Europe—this was an attainable goal. Proved reserves of mineral fuels in the U.S.S.R. are adequate to meet current production needs and to support continued economic growth. However, the inability of the fuel and power industries to make fine adjustments in operating functions prevents the most efficient use of available fuel and energy resources.

Many of the major fuel-consuming centers are located at great distances from sources of better quality fuels and have been forced to utilize poorer quality, high-cost local fuels. Moreover, the difficulties of transmitting energy over the vast distances encountered in the U.S.S.R. have resulted in the concentration of new economic activity in areas with already developed sources of energy. Sometimes this policy has contributed to an overburdening of local energy resources and has resulted in energy shortages. Summary Map insets show the location of exploitation of fuel resources, of petroleum refineries, of electrical power facilities, and of major pipelines. Pipelines are discussed in this General Survey in 3. Transportation and Telecommunications.

In the post-World War II period, oil and natural gas rapidly displaced coal as the basic source of energy for

the Soviet economy. In 1950, coal production supplied more than three times the amount of primary energy available from petroleum production; by 1968, coal production had more than doubled, but petroleum output had increased so rapidly that energy from coal amounted to only about two-thirds of the energy from petroleum (Figure 120). The transition has not been smooth. Annual production of individual fuels has frequently deviated from planned output; moreover, shift from solid to liquid and gaseous fuels has been complicated by imbalances in planning and by failure of the machine building industry to provide necessary equipment. For example, there is a serious shortage of secondary refining equipment needed to produce high-quality gasoline and diesel fuel, and the development of natural gas resources has been retarded by lack of deep-drilling, producing, transmission, and consuming equipment.

Since 1940 there has been a shift in the geographical pattern of production of the major fuels and of electric power. The share of the total Soviet output of fuels and electric power produced in the Regions East of the Urals has increased significantly, as is shown in the following tabulation (in percentages based on physical output):

	1940	1960	1968
Coal	29	36	41
Oil	6	7	12
Natural gas	1	2	26
Electric power	9	22	25

a. PRIMARY ENERGY—The U.S.S.R. ranks second to the United States among the nations of the world in the total production and consumption of primary energy (including coal, crude oil, natural gas, hydroelectric power, and peat), having increased its relative share of world production from about 11% in 1950 to about 18% in 1967. Rapid exploitation of the country's petroleum resources was part of the program adopted after the death of Stalin to modernize the technological structure

FIGURE 120. ESTIMATED PRODUCTION OF PRIMARY ENERGY
(Millions of metric tons of coal equivalents*)

	1950	1955	1960	1965	1967	1968
Solid fuels:						
Coal.....	205.7	310.8	373.1	412.5	428.6	428.7
Peat.....	14.8	20.8	20.4	17.0	22.4	18.6
Oil shale.....	1.3	3.3	4.8	7.4	7.5	7.6
Fuelwood.....	27.9	32.4	28.7	33.5	30.6	28.7
Subtotal.....	249.7	367.3	427.0	470.4	489.1	483.6
Petroleum:						
Crude oil.....	54.2	101.2	211.4	346.4	411.9	442.1
Natural gas.....	7.3	11.4	54.4	149.8	187.4	201.2
Subtotal.....	61.5	112.6	265.8	496.2	599.3	643.3
Total fuel.....	311.2	479.9	692.8	966.6	1,088.4	1,126.9
Hydroelectric power**.....	7.7	12.1	23.8	33.8	34.9	40.1
Grand Total.....	318.9	492.0	716.6	1,000.4	1,123.3	1,167.0

*Energy expressed in coal equivalent has a calorific value of 7,000 kilocalories per kilogram.

**Converted at the rate of fuel consumption per kw.-hr. of electricity produced in thermal powerplants.

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of the Soviet economy. The share of petroleum (including natural gas) in the production of primary energy increased from about 19% in 1950 to 55% in 1968, reflecting petroleum's displacement of coal as the major source of primary energy in the U.S.S.R. In 1968, hydroelectric power supplied less than 4% of the primary energy produced; fuelwood, oil shale, and peat combined accounted for less than 5%.

The U.S.S.R. is a net exporter of petroleum, and in recent years such exports have been its largest single source of foreign exchange. Annual exports of petroleum increased yearly through 1968, but indications are that they leveled off in 1969. Shipments in the latter year were about equally divided between Communist and non-Communist countries. The U.S.S.R. is also a net exporter of coal, although in recent years total exports of this commodity have not increased. About three-fifths of the coal exported in the last few years was shipped to the Eastern European Communist countries. The following tabulation of 1968 data shows that imports were negligible and that slightly less than 11% of the total domestic availability of energy was exported:

	MILLIONS OF TONS OF COAL EQUIVALENT	PERCENT
Supply of energy:		
Production of primary energy*	1,202.0	90.0
Imports	9.7	0.7
Balance at beginning of year	123.8	9.3
Total	1,335.5	100.0
Demand for energy:		
Apparent domestic demand for production	1,071.0	80.2
Electric and thermal power	443.1	33.2
Technological and other uses**	627.9	47.0
Exports	142.5	10.7
Balance	122.0	9.1
Total	1,335.5	100.0

*Total primary energy from Figure 120 is adjusted to include 35 million tons SCE shown in Soviet data as "other sources"; this comprises minor sources of primary energy, such as agricultural wastes, together with some secondary energy.

**Adjusted for losses in transport and storage.

b. COAL—According to official Soviet estimates, the total reserves of coal in the U.S.S.R. (proved, probable, and possible) amounted to 6.8 trillion metric tons in 1969. Geologically possible reserves, however, comprised 83% of this estimate, while proved and probable reserves accounted for only 3% and 14%, respectively, of the total. These estimates of reserves do not represent thorough exploration and study of all areas of the U.S.S.R.; consequently, higher or lower estimates of reserves may be forthcoming.

About 88% of the total reserves of Soviet coal are located east of the Urals, many of them in remote and inaccessible regions. These reserves, however, consist mainly of low-quality brown coals that are suitable for little beyond the generation of steam for electric power and heat. West of the Urals, deposits of better quality

coal are limited almost entirely to the Donets, Pechora, and Kizel basins, production from which has not kept pace with the requirements of the area. As a result, the European regions of the U.S.S.R. consume large quantities of bituminous coal from the Karaganda and Kuznets basins in the east. Coal from these sources is transported long distances (as much as 3,700 kilometers) to serve the major consuming areas.

Coal output increased rapidly from the end of World War II through 1958, when the U.S.S.R. displaced the United States as the leading coal-producing nation of the world. After the latter date, however, inadequate investment and significant shortfalls in the rates of increase planned for some of the coal basins in the Regions East of the Urals led to a substantial slowdown in growth of coal production (Figure 121). Since 1957, the U.S.S.R. has been a net exporter of coal; in 1968, net exports totaled slightly more than 14 million tons.

In 1968, 64% (about 379 million metric tons) of the coal mined in the U.S.S.R. was bituminous, 23% (about 138 million metric tons) was brown coal, and 13% (about 77 million metric tons) was anthracite. Preliminary data for 1969 indicate that total coal output was about 608 million tons.

c. PETROLEUM—The U.S.S.R. has vast resources of petroleum. However, the lack of modern equipment and technology and the continuation of wasteful production practices may limit future growth in output of oil and gas, especially as the center of production shifts eastward from the Urals-Volga area to the West Siberian region with its difficult climate, terrain, and working conditions.

The Soviet Union is the second largest producer of crude oil in the world, surpassed only by the United States (Soviet production data for crude are given in Figure 121 and for refined products in Figure 122. The production of about 328 million metric tons in 1969 represented about one-sixth of total world output and was equivalent to about 70% of U.S. production. Of all the major fossil fuels produced in the U.S.S.R., only crude oil has been produced in excess of planned quantities during much of the decade since 1960. Oil production has generally increased more rapidly than the domestic need for it since 1955, and Soviet exports of crude oil rose from 2.9 million metric tons in 1955 to 59.2 million metric tons in 1968.

The Urals-Volga region has been the major source of crude oil since 1955, and by 1969 this production area was contributing about 60% of the total Soviet output. The growth of production in this region was rapid, increasing from 29% of total Soviet output in 1950 to about 70% in 1966. The increase is attributed primarily to the use of the turbodrill (ideally suited for the shallow hard rock formations encountered) and to the extensive use of waterflooding to increase the rate of oil recovery. The waterflooding operations, however, were not conducted properly in many of the large oilfields, and as a result water encroachment has developed in recent years, leading to the loss of a substantial part of the oil

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FIGURE 121. PRODUCTION OF FUELS, BY TYPE
(Thousands of metric tons, unless otherwise indicated)

	1950	1955	1958	1960	1965	1967	1968
Solid fuels:							
Coal:							
Anthracite.....	40,158	57,834	*74,220	74,128	76,467	77,139	76,896
Bituminous.....	145,067	218,781	*278,810	300,797	351,414	374,283	378,775
(Coking coal).....	(51,697)	(77,744)	(94,407)	(110,198)	(138,959)	(147,623)	(154,498)
Brown coal.....	75,864	113,253	140,206	134,698	149,850	143,815	138,299
Total.....	261,089	389,868	493,236	509,623	577,731	595,237	593,970
Peat.....	36,000	50,800	53,300	53,600	45,800	60,200	50,000
Oil shale.....	4,716	10,793	13,188	14,147	21,259	21,601	21,868
Fuelwood (thousands of cubic meters)...	105,000	121,800	124,100	108,000	104,500	96,100	90,500
Petroleum:							
Crude oil.....	37,878	70,793	113,216	147,859	242,888	288,068	309,150
Natural gas (millions of cubic meters)...	5,761	8,981	28,085	45,303	127,666	157,445	169,101

*Estimated.

FIGURE 122. ESTIMATED OUTPUT OF REFINED
PETROLEUM PRODUCTS
(Millions of metric tons)

	1955	1960	1965	1967	1968
Gasoline.....	12.0	23.0	31.3	36.9	38.9
Kerosene.....	14.0	16.1	19.9	21.8	22.5
Diesel fuel.....	11.0	27.6	46.7	55.6	59.6
Lubricating oils.....	3.0	4.5	6.5	7.5	8.0
Heavy fuel oil and other residual products.....	21.0	42.7	68.0	80.4	86.7
Total refined products..	61.0	113.9	172.4	202.2	215.7

in place and a more rapid depletion of reserves. Consequently, the expected output of crude oil from these fields in 1980 may be less than the 300 million metric tons originally anticipated.

Extensive reserves of oil and gas have been discovered in West Siberia, in Central Asia along the eastern shore of the Caspian Sea, and in western Kazakhstan. Exploitation of these deposits is hampered by the lack of suitable drilling equipment as well as a shortage of large-diameter, long-distance pipelines.

The increase in output of petroleum products has paralleled the growth in production of crude oil. Total output of petroleum products in 1968 was about 3.5 times the level of 1955, as is shown in Figure 122. The rapid rise in output of petroleum products has been made possible by the expansion of refining capacity. Charge capacity for the distillation of crude oil increased from 90 million tons per year at the end of 1955 to about 270 million tons per year at the end of 1968. This primary distillation capacity is adequate to provide most of the supplies of oil products for domestic and export needs. The major deficiency in the refining sector has been the failure to install the necessary secondary facilities (catalytic cracking, catalytic reforming, hydrogen treating, etc.) to increase the yield and improve the quality of distillates. Diesel fuel, in

particular, has been in short supply at times, partly because of the heavy demand during the harvest season and partly because of the decision to emphasize exports of this product to earn foreign exchange.

Natural gas is produced in association with, as well as independently of, crude oil. About nine-tenths of the natural gas produced in the U.S.S.R. comes from nonassociated gasfields. Proved and probable reserves of nonassociated natural gas have increased impressively since 1950, as shown below (end-of-year data in billions of cubic meters):

1950	149
1955	492
1958	988
1965	3,411
1969	12,000

The ratio of proved reserves to annual production has fallen drastically as the production of natural gas increased from about 9 billion cubic meters in 1955 to 183 billion cubic meters in 1969. The U.S.S.R. has ranked second among world producers of natural gas since 1963. Its production, however, has repeatedly fallen short of planned output because of shortages of equipment.

Although proved and probable Soviet reserves are about 1.5 times the proved reserves of the United States, Soviet output of natural gas in 1969 was equivalent to only about 30% of U.S. output. Failures in meeting past goals for output, primarily due to shortages of deep-drilling, producing, consuming, and pipeline transmission equipment, resulted in lowering the 1970 goal from the original range of 225 to 240 billion cubic meters to about 196 billion cubic meters. The growth of the gas transmission pipeline system from only 4,860 kilometers (3,020 miles) in 1955 to an estimated 63,000 kilometers (39,000 miles) at the end of 1969 has been a major accomplishment of the industry. Pipeline connections enable the U.S.S.R. to export small quantities of natural gas to Poland and Czechoslovakia—a total of about 2 billion cubic meters in 1969.

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Trade in natural gas with non-Communist countries began in 1967. Afghanistan supplied small amounts to the U.S.S.R. via a newly constructed pipeline, and the U.S.S.R. exported by tanker 130 million cubic meters of liquefied natural gas to France. By 1971, imports of natural gas from Iran are to begin at a rate of 6 billion cubic meters per year and imports from Afghanistan are to reach about 3 billion cubic meters per year. Present agreements concluded with Austria, West Germany, and Italy call for Soviet export of about 9 billion to 11 billion cubic meters annually during the latter half of the 1970's.

Production of natural gas is largely concentrated in the Ukraine, Ciscaucasia (Stavropol'skiy Kray and Krasnodarskiy Kray), the Central Asian fields of the Uzbek and Turkmen S.S.R.'s, and the Urals-Volga region. Future increases in production are scheduled to come from gasfields in the Uzbek S.S.R., the Turkmen S.S.R., the Kazakh S.S.R., Komi A.S.S.R., Orenburgskaya Oblast', and western Siberia.

As total production of natural gas has increased, the relative importance of natural gas produced in association with crude oil has declined; it represented 34% of the total output of natural gas in 1955 and 11% in 1965. Even though an amount equal to nearly one-third of the annual production has been lost for lack of gathering facilities, production of associated natural gas was expected to increase from 16.5 billion cubic meters in 1965 to 22 billion cubic meters in 1970. Associated natural gas has become increasingly important as a raw material for the chemical industry. The U.S.S.R. has been slower than the United States to recognize the varied possible uses of natural gas liquids, particularly of liquefied petroleum gas (LPG). Only with the establishment of a petrochemicals industry and the desire to supply gas to rural regions have Soviet officials taken action to increase the production of natural gas liquids. Production of LPG in the U.S.S.R. increased from 0.5 million metric tons in 1959 to 4.2 million metric tons in 1968, compared with about 54 million metric tons produced in the United States in 1968.

d. ELECTRIC POWER—The U.S.S.R. possesses ample sources of energy (coal, waterpower, natural gas, petroleum, and peat) to meet all foreseeable requirements for the production of electric power. Soviet power systems have attained a high degree of reliability in the developed areas of the country, and the nation is not dependent on imports in any aspect of the industry. A relatively small, but increasing, amount of power is exported, most of it going to the Eastern European Communist countries, with small quantities going to Finland and Norway. Exports have grown from 34 million kilowatt-hours (kw.-hr.) in 1960 to 3.9 billion kw.-hr. in 1969, almost 0.6% of Soviet production.

In 1950, the U.S.S.R. became the world's second largest producer of electric power, with an output equal to about one-fourth that of the United States. Since

then, electric power capacity and output have grown rapidly as shown in the following tabulation:

	CAPACITY <i>Million kw.</i>	OUTPUT <i>Billion kw.-hr.</i>
1950	19.6	91.2
1955	37.2	170.2
1960	66.7	292.3
1965	115.0	506.7
1968	142.5	638.7
1969	154.4	689.0

By the end of 1964, Soviet output was equal to 40% of U.S. output, and it remained at about that relative level through 1969. The installed capacity of Soviet powerplants was 47% of that of the United States at the end of 1969. Soviet plans for 1970 called for increasing installed capacity to 166 million kw. and annual production to 740 billion kw.-hr.

Soviet production of electric power in 1969 represented 2,868 kw.-hr. per capita, only 35% of the 8,115 kw.-hr. per capita for the United States. However, regional variations in power availability are greater in the U.S.S.R. than in Western countries, and the share of power allocated to residential consumers is much smaller.

Consumption of electric power is concentrated in the most developed parts of the country: the central and northwestern European U.S.S.R., the eastern half of the Ukraine, and the central and southern Urals. In addition, there are a number of large power consumers, such as uranium separation plants and aluminum plants, located in central Siberia, where conditions are favorable for the production of low-cost electric power. Industry accounts for about 70% of the total Soviet consumption of power. Practically all of the population is served with electricity, but domestic supply is sometimes interrupted to meet industrial needs. Soviet consumers, moreover, are not well supplied with electrical appliances. In 1969 the combined number of refrigerators, washing machines, radios, and TV receivers in use was only slightly more than one-fifth of the number in the United States.

A major share of generating facilities is located in the European U.S.S.R., the Urals, and the Caucasus areas, near the large consuming centers. These facilities accounted for 75% of the electric power produced in 1968. A growing number of generating plants are located in central Siberia, where abundant supplies of fuel and hydropower offer the lowest production costs. The locations of existing and planned generating facilities and major transmission lines are shown on the Summary Map electric power inset, Figure 187.

Conventional thermal powerplants provide about 82% of the total production of electric power; hydrostations, 17%; and nuclear powerplants, about 1%. In 1968, thermal powerplants accounted for 25% of total Soviet consumption of fuel (in terms of coal equivalents). Coal, much of it low grade, has been and continues to be the major source of energy used in the generation of electric power. About 50% of the national

output of coal is used for this purpose and for the production of heat distributed by powerplants. Energy from coal accounted for 53% of total electric power produced in 1968 at thermal power stations. The use of natural gas and petroleum more than doubled from 1958 to 1968 and, in the latter year, provided energy for 37% of the power produced at thermal powerplants.

One-tenth of the world's hydropower resources are located within Soviet boundaries, largely in Siberia and the Soviet Far East. The estimated potential capacity of these resources is 240 million kw. It is estimated, however, that only about 52% of this capacity may be economically exploitable—sufficient to produce approximately 1.1 trillion kw.-hr. annually. The country's hydropower resources are not favorably distributed. Of the estimated total water power potential, 70% is in the central and eastern parts of Siberia and in the Soviet Far East, 15% in Soviet Central Asia, and 10% in the Caucasus. The remaining 5% is in the most densely populated and industrialized parts of the country—central European U.S.S.R., the Ukraine, and the Urals—where the most favorable sites for hydroelectric powerplants are already being utilized.

In connection with the development of hydroelectric generating capacity in the U.S.S.R., some of the largest dams and impoundment reservoirs in the world have been constructed. Until recent years most of the hydroelectric power development took place in the European U.S.S.R., where cascades of hydroelectric stations have been built on such major rivers as the Volga, Kama, and Dnepr, close to established centers of industry and population. Most of the rivers in the European U.S.S.R. flow through generally flat terrain and have gentle gradients and great seasonal variations in flow. Long earth and rock gravity dams have been built to provide a constant water supply in the large volume needed. The longest such dam, near Kiyev, extends about 40 kilometers.

Since 1960 the U.S.S.R. has begun to exploit hydroelectric resources in Siberia where deep gorge sites offer the possibility for higher heads and require less reservoir area. The most powerful hydroelectric stations in the world are rising in this region. The Krasnoyarsk hydroelectric plant, on the Yenisey river, has reached a capacity of 5 million kw. and the Bratsk hydroelectric plant, on the Angara river, has reached 4.1 million kw.; even larger plants are planned or under construction. The largest hydroelectric plant in the United States is the Grand Coulee, with a capacity of 1,974,000 kw. The exploitation of the rivers of Siberia for the production of cheap electric power is planned as the basis for the industrialization of the eastern regions of the country.

The typical Soviet powerplant is a large, modern, and efficient facility. More than 60% of the nation's total generating capacity has been put into operation in the last 10 years, and one-third of the thermal powerplant equipment is 5 years old or less. In 1966, the Pridneprovskaya GRES (State Regional Electric Powerplant), at Dnepropetrovsk in the central Ukraine,

was the world's first thermal powerplant to attain a capacity of 2.4 million kw., and three other Soviet thermal powerplants have now reached this size. They have since been surpassed in size, however, by one thermal powerplant in the United States and one in Japan. In the period 1960 to 1970 Soviet expansion of thermal powerplants was based largely on the installation of generating units of 200,000 and 300,000 kw. each, and at the end of 1969 there were 130 of these units in operation. One unit of 500,000 kw. and one of 800,000 kw. were installed during this period. By 1980, the capacities of individual thermal powerplants will be increased to 3 million or 4 million kw., and units of 500,000 and 800,000 kw. are expected to become the basic equipment. The Soviet 300,000-kw. generating units are designed to operate at supercritical parameters,¹⁷ but many have not yet operated at designed levels or realized the anticipated economies in fuel consumption. Supercritical units of larger capacity have achieved much greater success in the United States and other technically advanced countries.

The U.S.S.R. leads the world in the development of high-voltage transmission of electric power, 330 kilovolts (kv.) and higher. Rapid advance in this field has been stressed because of the need to transmit large amounts of power over long distances. Transmission of electric power is accomplished by 92 separate networks that cover virtually all developed areas. Most of these networks are joined with others to form nine large power systems, which are composed of plants producing about 87% of all the electric power in the Soviet Union. Seven of these power systems have been linked to form the United Power System of the European U.S.S.R. It has a total generating capacity of almost 93 million kw. and includes about 600 powerplants. The main interconnections are 110-, 220-, and 330-kv. powerlines. The systems of central European U.S.S.R., the middle Volga region, and the central and southern Urals are linked by 500-kv. lines that are capable of transmitting 800,000 kw. of power for distances up to 1,000 kilometers (621 miles). Similar 500-kv. transmission lines join the power networks from Novosibirsk to Irkutsk in central Siberia, and 500-kv. lines are being built to form a power system of Soviet Central Asia. At the beginning of 1970, there were 14,000 kilometers (8,699 miles) of 500-kv. transmission lines in operation. A number of international transmission lines are in operation across the western borders of the U.S.S.R. From the Mukachevo transformer station in the southwest Ukraine, 400-kv. transmission lines extend to Czechoslovakia, Romania, and Hungary, and a 220-kv. line extends from the Belorussian S.S.R. to Poland. Another 400-kv. line is now under construction from the Moldavian S.S.R. to Bulgaria. These connections are all part of the Mir (Peace) grid, which joins the Eastern European Communist countries into a single network.

¹⁷Pressure above 3,206 pounds per square inch and temperature above 705°F., the point at which water flashes into dry steam without boiling.

In 1962 the U.S.S.R. commissioned a 475-kilometer experimental direct current (DC) transmission line from Volgograd to the Donets Basin. This line operates at 800 kv. and is being used to gain experience for constructing lines of even higher voltages to transmit power over long distances.

The Soviet power industry is supported by a well-developed electrical equipment manufacturing industry. Its production is sufficient for the prospective growth of generating capacity as well as transmission and distribution facilities in the U.S.S.R. and for some exports to other countries. Research and development facilities are adequate to the task of solving technical problems in equipment design, and developing and designing new equipment.

3. Minerals and metals

The Soviet metallurgical industry is among the largest in the world, leading in the production of many ores and basic materials and ranking second in the output of pig iron, crude steel, copper, nickel, and aluminum. (For the location of production centers, see the metallurgy Summary Map inset, Figure 187.) Although the Soviet metallurgical industry is endowed with probably the largest raw material base in the world, reserves of high-grade ores—particularly certain of the nonferrous ores—are declining. Furthermore, considerable portions of the plentiful ore reserves cannot at present be recovered economically. The U.S.S.R. has demonstrated its ability to develop special techniques and equipment for the production of metals and special alloys essential to the attainment of its military and economic goals, although the general trend has been more toward improving technology for quantity rather than for quality production.

a. MINERALS

(1) *Metallic minerals*

(a) **IRON ORE**—As of January 1966, the date of the latest published Soviet estimate, proved iron ore reserves were 56.1 billion tons, the largest in the world if Soviet claims are correct. The iron content of these huge reserves is 36%—below the quality of reserves in the United States but substantially higher than the quality

of most West European reserves. The U.S.S.R. is the largest producer of iron ore in the world, providing completely for its own needs and furnishing over 80% of the usable ore requirements of the Eastern European Communist countries. Declining ore quality has necessitated large-scale construction of concentrating as well as sintering and pelletizing plants. (Areas producing iron and other metallic ores are shown in the Summary Map fuels and metallic minerals inset, Figure 187.)

(b) **FERROALLOYING MATERIALS**—The U.S.S.R. also has abundant reserves of ferroalloying materials—manganese, chromite, tungsten, molybdenum, nickel, and cobalt—and is a leading producer of most of these ores. Production of ferroalloying materials is shown in Figure 123.

Among the major steel-producing nations, the U.S.S.R. alone is fully self-sufficient in manganese. Reserves in excess of 2 billion metric tons assure the country of an adequate supply of manganese for well over a century at the present rate of consumption. The U.S.S.R. is the largest producer of manganese ore, accounting for more than one-third of world production. Production of manganese exceeds domestic requirements, leaving a sizable surplus for export. In 1969, Soviet exports of manganese amounted to 1,197,000 metric tons, or 17% of production.

The U.S.S.R. claims to have the largest explored reserves of chromite in the world and is the leading producer of chromite ore. In 1969 about 2.2 million metric tons of chrome ores containing an estimated 900,000 metric tons of chromite were mined. About 80% of the 1,144,000 metric tons of chrome ores and concentrates exported in 1969 was shipped to non-Communist countries, including the United States.

The Soviet Union also claims the world's largest explored reserves of nickel, tungsten, and molybdenum. It is the largest producer of tungsten concentrates (WO_3), accounting for about 25% of world production in 1968, and is second only to Canada in the production of refined nickel.

FIGURE 123. PRODUCTION OF USABLE IRON ORE AND FERROALLOYING MATERIALS

	1955	1960	1965	1968	1969	1970 (PLAN)
<i>Millions of metric tons</i>						
Usable iron ore.....	71.9	105.9	153.4	176.6	186.0	209.0
Ferroalloying materials:						
Manganese ore.....	4.7	5.9	7.6	6.6	7.0	7.7
<i>Thousands of metric tons</i>						
Chromite.....	304.0	519.5	735.0	867.0	900.0	950.0
Tungsten.....	7.5	11.4	14.0	14.0	14.0	na
Molybdenum.....	2.8	4.8	7.3	8.5	9.0	na
Nickel, refined.....	46.0	72.0	100.0	124.0	133.0	na
Cobalt.....	0.9	1.6	3.4	4.2	4.4	4.6

na Data not available.

25X1

25X1

(c) **NONFERROUS ORES**—The Soviet Union is self-sufficient in most nonferrous ores. Aluminum, lead, zinc, copper, antimony, and cadmium are produced in large enough quantities to permit sizable net exports, but there are shortages in both tin and uranium.

Reserves of aluminous raw materials in the U.S.S.R.—mainly bauxite and nepheline—are very large, with bauxite reserves possibly being the largest in the world. The economic significance of these reserves is reduced by the generally low alumina and high silicon contents of the ores and by the unfavorable locations of some deposits. Moreover, reserves of nepheline ores represent a practically inexhaustible source of alumina, but difficulties have been encountered in developing processes for chemical separation of alumina from the nepheline. Exploitation of these resources, however, has not kept pace with the growth of the industry; as a result, both bauxite and alumina have been imported to supplement domestic supplies.

The U.S.S.R. claims to be first in explored reserves of lead, with an estimated 18 million metric tons lead content in 1965. The average content of lead in reserves ranges between 1.6% and 5.5%, a metal content generally below that of reserves of major Western lead producers. The bulk of the ore mined is obtained from low-grade polymetallic lead-zinc deposits, largely scattered throughout the Regions East of the Urals, which, for the most part, are worked inefficiently by costly underground methods. The number of highly mechanized and economic open-pit operations has increased gradually, however, and, by 1970, 30% of the ore was to come from open pits.

The U.S.S.R. also claims the world's largest zinc reserves, estimated for 1968 at more than 29 million metric tons. The average zinc metal content of Soviet ores has declined from the level of former years as a result of the exploitation of the higher grade reserves and the failure to discover ore bodies of like metal content to replace them. Perhaps 80% of the zinc ore output is mined from the low-grade polymetallic lead-zinc deposits. The average zinc content of concentrates probably is close to 60%, reflecting recent improvements in concentrating technology.

Available data indicate that known Soviet copper reserves were 52.8 million metric tons of contained metal in 1965. However, with a copper content probably averaging less than 1%, the general quality of Soviet copper reserves is relatively low.

Tin resources of the U.S.S.R. are located primarily in the Far East and eastern Siberia. Additional deposits of tin in Kazakhstan and Soviet Central Asia hold little promise for making a significant contribution to Soviet tin supplies. Because of the complex nature and low tin content of Soviet ores, concentration is begun at the mining sites. Concentrates containing 10% to 30% tin are then shipped to central facilities where further processing produces a concentrate with a tin content as high as 70%. Domestic production from Soviet ores, however, has been inadequate to meet demand, and imports have been required.

The uranium available to the U.S.S.R. from domestic production must be augmented by imports from the Eastern European Communist countries, chiefly East Germany and Czechoslovakia, in order to meet Soviet needs. Production is estimated at close to 20,000 tons of recoverable uranium metal per year. Soviet ore concentration plants are well designed and have substantial capacities, usually of 500 to 1,000 tons of ore per day, although several plants have substantially larger capacities. The newer plants use modern ion-exchange and solvent extraction recovery methods.

The principal Soviet deposits of vein and placer gold are in the northeastern areas of the country, in the basins of the Kolyma, Indigirka, Aldan, Yana, and Lena rivers; in Transbaykalia; and in the Urals. Intensive prospecting has extended the boundaries of known gold-bearing areas and has uncovered several rich deposits that are now being developed in Soviet Central Asia. Production of gold in the U.S.S.R. since 1960 is estimated to have ranged from 110.2 million to 194.9 million grams a year.

(2) *Nonmetallic minerals*—Nonmetallic minerals are generally abundant in the U.S.S.R., particularly those required for chemicals, fertilizers, and construction materials. There is, however, a shortage of a few important nonmetallic minerals such as natural abrasives, fluorspar, and high-quality mica.

b. METALS

(1) *Ferrous metals*—Prompt reconstruction of facilities lost in World War II enabled a rapid growth in the postwar production of pig iron, crude steel, and finished steel (Figure 124). Between 1950 and 1965, however, the failure to add the planned amount of new capacity not only delayed the introduction of new steel industry technology but set back indefinitely schedules for the retirement of old, outmoded facilities. Also, programs to improve the quality and to broaden the assortment of steel products, undertaken to meet the increasingly sophisticated needs of the Soviet economy, were only partially successful. Construction of new capacity during the Five Year Plan (1966-70) continued

FIGURE 124. PIG IRON AND STEEL PRODUCTION
(Millions of metric tons)

25X1

	PIG IRON	CRUDE STEEL	ROLLED STEEL
1950.....	19.2	27.3	20.9
1955.....	33.3	45.3	35.3
1958.....	39.6	54.9	43.1
1960.....	46.8	65.3	51.0
1961.....	50.9	70.8	55.3
1962.....	55.3	76.3	59.2
1963.....	58.7	80.2	62.5
1964.....	62.4	85.0	66.7
1965.....	66.2	91.0	70.9
1966.....	70.3	96.9	76.7
1967.....	74.8	102.2	81.7
1968.....	78.8	106.5	85.3
1969.....	81.6	110.3	87.5

to lag, with the result that the rate of industry growth declined and the production goal of 124 million to 129 million tons of crude steel in 1970 was reduced to 115 million tons. Moreover, Soviet leaders have continued to criticize the steel industry for failures to provide the economy with new and improved types of steel products.

Soviet production of pig iron (including blast furnace ferroalloys) in 1969 amounted to 81.6 million tons, or 94% of U.S. production. About 85% of the pig iron produced by the U.S.S.R. is used for steelmaking and about 15% for iron castings. Estimated Soviet blast furnace capacity at the beginning of 1969 was 85 million tons. In 1968, the U.S.S.R. had 131 blast furnaces in operation in 37 plants; of these furnaces, 99 were located in 20 plants which produced more than 1 million tons each, accounting for more than 90% of the nation's output of pig iron. Important steps taken to improve blast furnace performance in the U.S.S.R. have included the conversion of furnaces to high top pressure (106 furnaces converted by the end of 1968), the use of natural gas as blast furnace fuel (102 furnaces operating with natural gas in 1968), and the injection of oxygen into the blast.

At the beginning of 1969 the steelmaking capacity of the U.S.S.R. was estimated at about 115 million tons or 70% of estimated capacity in the United States. By operating at a much higher ratio of capacity utilization, Soviet steel mills produced 110 million tons in 1969, or 86% of U.S. production.

Most of the steel produced in the U.S.S.R. is made by the open hearth process. Although only a few new open hearth furnaces were constructed in the 1966-70 plan period, production of steel by this method has continued to expand, reflecting Soviet success in improving technology and intensifying operations at existing open hearth shops to compensate for the lag in adoption of the oxygen converter steelmaking process. In contrast, production of open hearth steel has declined markedly in the United States since 1964 as rapid gains have been made in production of steel by the oxygen converter. An important share of Soviet steel is produced in electric furnaces, but difficulties have been encountered in building electric furnaces with capacities in excess of 100 tons. In the United States, 200-ton electric furnaces are in use.

To improve steel quality and to develop new alloys for aircraft and missile programs, the U.S.S.R. has followed Western developments in large-scale vacuum processing techniques. In another area of vacuum metallurgy, electron beam remelting, the U.S.S.R. has made considerable progress, using some domestically manufactured equipment as well as a large number of electron beam furnaces imported from East Germany. In addition to vacuum processing, the U.S.S.R. has devoted considerable attention to electroslag remelting, a less costly method of improving steel quality. Although not fully equal to vacuum processing, particularly in applications where the highest purity is desired, electroslag remelting has gained acceptance in

a variety of other applications. The Soviet Union ranks as a world leader in development and industrial use of electroslag remelting and has licensed its process for use in Japan and Western Europe.

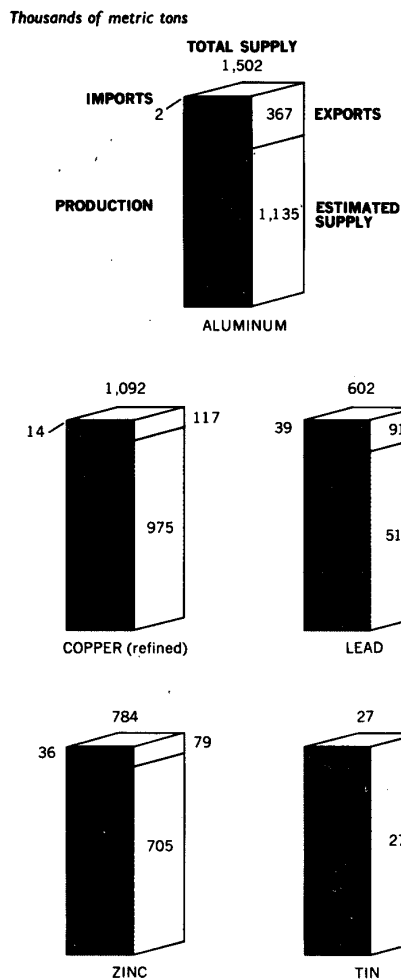
Soviet technicians have pioneered development of the continuous casting of steel to eliminate conventional ingot casting and associated blooming and slabbing operations. By 1968, 85 continuous casting strands had been installed with a total rate capacity of 9.1 million tons, representing nearly one-fourth of known world capacity. Only slow progress has been made, however, in expanding production. In 1968, annual output from continuous casting installations in the U.S.S.R. had reached only 3.34 million tons, far behind the original 10 million-ton goal for 1965.

The Soviet product mix for rolled steel differs markedly from that in the United States, reflecting the orientation of the Soviet economy toward construction and capital goods production. The output of light flat-rolled products, largely used in automobiles and consumer goods, accounted for about 26% of the total Soviet output of rolled products as against about 55% in the United States during 1968. In the U.S.S.R., some 55% to 60% of all rolled steel is consumed by machine building and metalworking industries. Another 20% to 25% is consumed in construction. Of the remainder, significant shares go for the maintenance and repair of capital goods and for the construction and maintenance of railways and oil and natural gas pipeline systems.

Soviet rolling and finishing technology is less advanced than that in the United States. The lag in the rolling and finishing sector stems from a greater emphasis given in past years to iron and steelmaking technology and from the long lead times required in the design, manufacture, and installation of the more complex types of rolling mill equipment. The U.S.S.R. has lagged especially in the application of automated techniques to rolling mill processes and in the development of many types of finishing line equipment important to achievement of high-quality products.

Soviet gross exports of steel mill products attained a level of 7 million metric tons in 1969. During the period 1960-69, Soviet net exports of finished steel represented about 4% of domestic production. Net exports reached a total of 4.3 million metric tons in 1966, declined to 3.7 million metric tons in 1968, and rose again to 4.3 million metric tons in 1969. Shipments to the Eastern European Communist countries accounted for about 85% of total exports of finished steel. Most of the finished steel imported from non-Communist countries has been in the form of large-diameter pipe, other tubular products, flat rolled steel, and light structural shapes.

(2) *Nonferrous metals*—The U.S.S.R. is self-sufficient in many nonferrous metals. Aluminum, copper, zinc, and lead are produced in large enough quantities to permit net exports, but there are shortages of tin. The estimated supply position of major nonferrous metals in 1969 is shown in Figure 125.



Note: Production figures are for primary metal, but the import and export figures for aluminum and copper include some processed metal.

FIGURE 125. Estimated supply position of principal nonferrous metals, 1969

Since 1961 the U.S.S.R. has been the world's second largest producer of aluminum (Figure 126). Exports of aluminum ingot and rolled products have been growing steadily and reached more than 400,000 metric tons in 1969. The larger share of the exports has gone to the Eastern European Communist countries, principally East Germany.

The U.S.S.R. is the second largest copper producer in the world, after the United States. Although a net exporter of copper since 1964, the Soviets, as a matter of policy, seek to conserve this metal by actively encouraging the substitution of other, more abundant and cheaper metals, particularly aluminum. Some 50% of Soviet copper production is consumed in electrical applications such as cable, wire, bus bars, and contacts.

FIGURE 126. ESTIMATED PRODUCTION OF PRINCIPAL NONFERROUS METALS* (Thousands of metric tons)

	ALUMINUM	COPPER**	LEAD	ZINC	TIN
1955.....	430	377	258	222	7.6
1958.....	510	406	288	315	9.2
1960.....	630	490	324	364	10.6
1961.....	700	530	326	377	11.3
1962.....	770	590	346	403	12.0
1963.....	855	640	385	419	12.7
1964.....	945	700	408	436	13.4
1965.....	1,000	772	433	504	14.0
1966.....	1,160	828	463	551	15.2
1967.....	1,295	915	495	610	16.7
1968.....	1,435	992	528	678	18.0
1969.....	1,500	1,078	563	748	19.6

*Primary production.

**Refined.

The U.S.S.R. is also a large producer and consumer of lead. Since its lead ores are generally low grade, it is partially dependent on imports to augment domestic supplies of ores and concentrates. Because of the short supply, domestic consumption of lead has been limited to about 40% of that of the United States. Considerable emphasis has been placed on the substitution of more abundant metals—steel, aluminum, and zinc—as well as of plastics.

The Soviet Union imports zinc ores and concentrates, but, in recent years, imports of ores and concentrates have declined considerably compared with the late 1950's and early 1960's. With respect to trade in zinc metal, the country has consistently been a net exporter since 1957. Most exports of zinc metal go to Communist Eastern Europe, primarily East Germany and Czechoslovakia. Soviet imports of zinc metal are obtained mainly from Poland and North Korea. About 70% of the zinc metal available to the Soviet economy is used either in galvanizing, in producing brass and bronze, or in diecasting alloys. Large amounts of ingot metal have been consumed in production of zinc oxide for use in the rubber and paint industries, and efforts now are being made to obtain zinc oxide from o25X1 sources such as stack-gases of slag-fuming installations.

Among the Communist countries, the U.S.S.R. is the largest producer of primary tin, but domestic consumption has exceeded production for more than a decade. Until 1962, however, substantial exports of tin were possible as a result of large imports of the metal from Communist China. Since then, imports from Communist China have been insignificant, and the U.S.S.R. has become a net importer of tin, buying some 4,000 to 7,000 metric tons annually from non-Communist countries.

4. Manufacturing and construction (S)

a. MACHINERY, EQUIPMENT, AND FABRICATED METAL PRODUCTS

(1) *General*—Almost all of the machinery, equipment, and fabricated metal products manufac-

tured in the U.S.S.R. are produced in the machine building and metalworking industry.¹⁸ (See the machine building and metalworking inset, Summary Map, Figure 187.) This industry is dependent primarily on the metallurgical industry for its supply of semifinished materials, although the production of castings and forgings is largely concentrated in the industry itself. The machine building and metalworking industry supplies a large part of its output to the construction, agricultural, and transportation sectors of the economy. However, machine building is also one of its own best customers, because it consumes a large share of the output of all types of industrial equipment. Despite repeated Soviet announcements of programs designed to make the machine building industry the most highly automated in the world, these programs have not been successfully implemented; the industry remains generally inferior in plant technology to the machine building industries of the West.

The machine building and metalworking industry is marked by strong vertical integration, although less so than in earlier years. The opportunities for greater specialization and subcontracting have never been fully realized, primarily because the materials supply system is so undependable that many producers are unwilling to entrust the manufacture of essential work pieces, parts, and components to other plants. As a result, Soviet industry does not approach the level of plant specialization and subcontracting found in U.S. machinery industries.

By any standard, machine building and metalworking is the largest of all Soviet industries. It has consistently enjoyed a high priority of development, not only because it is a key industry in the achievement of national economic growth but also because of its strategic importance as the supplier of equipment for defense and space programs and of instrumentation for scientific investigation.

Although highly successful in applying the principles of mass and large-scale production to the manufacture of stock items, Soviet machine building has had an undistinguished record in the development of new and special products. Thus, the product mix of Soviet machine building tends to be obsolescent by Western standards. This situation is largely a fault of the system; changes in the product mix and production methods are inhibited by the prospect of lowered output and profits for the firm during the lengthy period needed for the introduction of new technology. Also, the estrangement in the Soviet Union between research and development,

on the one hand, and production engineering, on the other, contrasts strongly with the teamwork generally found within comparable enterprises in market-oriented economies. This estrangement tends to rob the Soviet economy of a source of more dynamic economic growth.

The U.S.S.R. is a net importer of machinery and equipment. It relies to a great extent on imports from both the Eastern European Communist countries and the Industrial West for transportation equipment and for equipment needed by the motor vehicle, chemical, food, paper, and textile industries. These imports have been dictated not only by the inadequacy of the Soviet machine building industry but also by the aim of acquiring foreign technology—primarily Western—in the shortest possible time. Machinery and equipment is the largest single category in Soviet foreign trade turnover, accounting for about 26% of the total in 1968. The U.S.S.R. is a net importer of machinery and equipment in contrast to the United States, as shown by the following comparison for 1968 (in billions of U.S. dollars):

	U.S.S.R.	UNITED STATES
Exports	2.3	14.5
Imports	3.5	8.0

(2) Production

(a) COMPETITION BETWEEN CIVILIAN AND MILITARY PRODUCTION—The machine building industry is the source of equipment for military-space programs as well as the supplier of producer and consumer durables. In the 1950's, competition between military and civilian requirements was particularly strong but has diminished as a result of the vigorous overall growth of the industry and the declining share of military production. After 1955, the rate of increase in the production of producer and consumer durables combined exceeded the rate of increase in the production of military machinery in every year except 1961-62 and 1967. By 5-year periods, the percentage rates of growth have been as follows:

	1951-55	1956-60	1961-65	1966-69
Total machinery	12.3	8.6	7.4	8.5
Civilian machinery .	11.7	13.9	8.6	9.3
Military machinery .	12.8	2.8	5.5	6.9

In 1969, military machinery accounted for about one-third of machine building production, compared with more than one-half in 1955.

Another feature of the relative priorities in the machine building industry has been the consistently higher growth rate of consumer durables. Starting from a small base, the output of consumer durables grew at an average rate of 24% a year in 1951-60, compared with 12% a year for producer durables. Although the very high rate of increase of consumer durables production was not maintained in the 1960's, output continued to grow much more rapidly than the output of producer durables. Indeed, the margin in favor of consumer durables has widened since the early 1960's,

¹⁸In addition to what is broadly defined as machinery (nonelectrical and electrical) in the United States, the Soviet definition of machinery includes all types of transportation equipment, military equipment, and all professional, scientific, and control instruments, including such products as photographic equipment, optical goods, and timepieces. This industry also fabricates metal products such as cable, metal fasteners, structural metal pieces, and metal containers and utensils. In addition, a substantial amount of repair of industrial equipment is performed in the specialized repair facilities of the machine building and metalworking industry.

as shown in the following compilation of average annual percentage rates of increase:

	1951-55	1956-60	1961-65	1966-69
Producer durables	10.4	13.4	8.0	8.0
Consumer durables	30.0	17.9	11.9	16.6

(b) DEFENSE PRODUCTION—Between 1960 and 1969, the combined outlay for defense and space programs increased by 47%, the major increase occurring in expenditures for research and development. The production of military machinery and equipment grew at an average annual rate of around 6% during those years. At the same time, a substantial shift occurred in the mix of defense items as the share for missiles, nuclear weapons, and research and development (including space) increased from approximately 30% of total military expenditures in 1960 to about 45% in 1969.

While military programs represent a direct drain on Soviet resources, the defense burden is not as critical as it once was. The share of GNP devoted to defense and space programs has fallen from about 15% in 1950-52 to 8% in recent years. However, the increased spending on military research and development does have an important impact on economic growth. The isolation of Soviet military and space research and development and production activities largely prevents the flow of new technology and skilled manpower from these programs into the civilian economy. The civilian sector is thereby deprived of the skilled engineers needed to introduce more advanced technology in civilian production.

1) Specialized Military Vehicles—The major specialized vehicles produced by the U.S.S.R. in terms of quantity and tactical importance are medium tanks, armored personnel carriers (APC), and infantry combat vehicles (ICV). Soviet production facilities for military vehicles differ from those in many other industrialized countries in that there are no facilities that can be called tank arsenals. Instead, military vehicles are made in plants that produce a variety of other items such as railroad cars, locomotives, and tractors. In the past, armored vehicle producers have met the demand for medium tanks—producing 2,850 of these tanks in 1969—and will probably continue to do so. However, the demand for armored personnel carriers has not been met; the 1,380 APC's produced in 1969 were less than the number desired.

2) Aircraft—The aircraft industry of the U.S.S.R. is second in size only to that of the United States. Most Soviet airframe and engine plants have some capacity for the manufacture of either missile airframes or consumer goods, production of which helps provide stable employment for their labor in the industry which is noted for its wide fluctuations in output. The industry has a large investment in facilities for production and research as well as a significant share of the country's engineering and technical personnel. The aircraft industry not only fulfills Soviet

military and civilian requirements for aircraft but also provides military and transport aircraft for sale abroad to both Communist and non-Communist countries. As a result of its high priority, the industry has no apparent long-range bottlenecks. Its facilities are believed to be sufficiently balanced so that engines and components would be available to support a maximum production effort in the airframe plants. In general, the industry makes use of a fairly narrow range of off-the-shelf engine types to power its military and civil aircraft. The industry is striving for and attaining improved quality in the aircraft being produced. A supersonic transport (SST) is being developed, a prototype of which began flight tests in late 1968.

Soviet production of aircraft since World War II has been characterized by a decline in numbers and a substantial increase in airframe weight. In 1969, for example, the estimated number of aircraft produced was about 65% of the total produced in 1960. However, the improved capabilities, greater efficiency, and longer service life of the newer aircraft make fewer necessary. In addition, new weapons systems have reduced the need for certain kinds of combat aircraft. The U.S.S.R., moreover, imports many of the light aircraft it needs from the Eastern European Communist countries. The estimated production of about 1,800 aircraft in 1969 included about 60 bombers, about 850 fighters, about 480 transports, about 320 helicopters, and a small number of reconnaissance and light aircraft.

3) Missiles and Space Equipment—The Soviets have developed a formidable array of ballistic missiles, aerodynamic vehicles, and space equipment since World War II. Beginning with a Soviet version of the 150-nautical-mile (280-kilometer) German V-2 rocket, the U.S.S.R. has extended the range of its surface-to-surface ballistic missiles to over 7,000 nautical miles (13,000 kilometers) for large ICBM's. Several naval missiles, both ballistic and aerodynamic, have been deployed, and a wide range of other missiles has been introduced, including several series of surface-to-surface aerodynamic (cruise) missiles, antitank guided missiles, air-to-surface missiles, air defense missiles (SAM's), and air-to-air missiles. Since taking the first heat in the space race with Sputniks I and II in 1957, the U.S.S.R. has developed more sophisticated space vehicles and ancillary systems, although about 60% of their launches still employ the same basic booster—with upper stage modifications—which has been used since the early stages of their space program. More than 450 space launchings have been attempted, ranging from small astrophysical and interplanetary probes through communications and military reconnaissance satellites up to manned space vehicles and large scientific payloads of about 20 tons.

In the missile and space fields, the U.S.S.R. has adopted the same development strategy that characterizes its programs in other fields of production—the use of proven designs, tested production techniques, off-the-shelf hardware when

possible, and the application of one design in many roles. All or nearly all of the items that go into the production stream for Soviet missiles and space systems are supplied from domestic sources. Many industries are involved: for example, the electronics, machine building, chemical equipment, and optical plants that supply components for a missile; metallurgical plants that provide metal for the airframe and other components; and the trailer, tractor, and railroad equipment plants that make ground-support equipment.

(c) CIVILIAN PRODUCTION—Production of major types of capital goods and consumer durables manufactured by the Soviet machine building industry is shown in Figure 127.

1) Capital Goods—Even though the growth in production of most capital goods fluctuates from year to year, certain categories (in particular, chemical equipment and electronic computers) have shown consistently higher increases than the machine building industry as a whole. The value of production of chemical equipment in 1969 was more than twice the level in 1960, and the value of output of the instrument industry tripled during the same period. Since 1968 the value of output of the instrument industry has been growing at about 18% per year. In addition, the rate of growth of the electronics industry, which includes the production of electronic instruments and computers, has been growing at an average annual rate of about 16% since 1965; however, the “technology gap” between the

FIGURE 127. PRODUCTION OF CAPITAL GOODS AND CONSUMER DURABLES BY THE MACHINE BUILDING INDUSTRY

25X1

	1950	1955	1960	1965	1968	1969
Capital goods:						
Agricultural machinery:						
Cultivators (tractor-powered) (thousands of units).....	98.9	112.6	84.8	206.3	207.1	*195.6
Grain combines (thousands of units).....	46.3	48.0	59.0	85.8	101.3	94.5
Plows (thousands of units).....	121.9	103.2	149.1	165.7	136.7	*207.6
Sowing machines (tractor-powered) (thousands of units).....	117.7	115.4	111.9	261.7	173.6	*187.0
Chemical equipment (millions of new rubles**).....	24	76	223	383	443	*464
Coal mining equipment:						
Coal cutters (thousands of units).....	0.9	0.4	0.4	0.2	0.2	na
Coal combines (thousands of units).....	0.3	0.7	0.9	1.0	1.2	na
Construction equipment:						
Bulldozers (thousands of units).....	3.8	7.5	12.8	20.0	29.8	33.3
Cranes*** (thousands of units).....	5.4	9.0	10.0	15.5	19.0	*19.0
Excavators (thousands of units).....	3.5	5.2	12.6	21.6	27.0	29.3
Electrical and power equipment:						
Boilers (thousands of metric tons of steam per hour).....	13.0	41.1	50.3	82.1	93.1	na
Generators for turbines (millions of kw.).....	0.9	4.5	7.9	14.4	14.5	12.7
Turbines (millions of kw.).....	2.7	5.6	9.2	14.6	15.8	15.1
Transformers (millions of kv.-a.).....	10.2	19.7	49.4	95.3	105.1	na
Instruments (billions of new rubles**).....	0.1	est 0.3	1.2	2.1	3.2	3.8
Machine tools:						
Metalcutting machine tools (thousands of units).....	70.6	117.1	155.9	186.1	200.8	206.0
Metalforming machine tools (thousands of units).....	7.7	17.1	29.9	34.6	42.1	42.7
Metallurgical equipment (thousands of metric tons).....	111.2	172.1	218.3	242.3	322.5	319.0
Blast furnace equipment (thousands of metric tons).....	19.4	32.4	60.9			
Rolling mill equipment (thousands of metric tons).....	66.1	108.5	120.6	111.2	153.2	na
Steel smelting equipment (thousands of metric tons).....	25.7	31.2	36.8			
Petroleum refinery equipment (thousands of metric tons).....	47.9	48.8	93.0	139.7	125	*123
Rolling stock:						
Mainline freight cars (thousands of units).....	50.8	34.4	36.4	39.6	48.1	50.2
Mainline locomotives (thousands of units).....	1.2	1.0	1.7	2.1	1.8	1.7
Tractors, crawler and wheeled (thousands of units).....	116.7	163.4	238.5	354.5	423.4	441.8
Trucks (thousands of units).....	294.4	328.1	362.0	379.6	478.2	504.5
Durable consumer goods:						
Passenger cars (thousands of units).....	64.6	107.8	138.8	201.2	280.3	293.6
Radios (millions of units).....	1.1	3.5	4.2	5.2	7.0	7.3
Refrigerators (millions of units).....	Insig	0.2	0.5	1.7	3.2	3.7
Sewing machines (millions of units).....	0.5	1.6	3.1	0.8	1.3	na
Electric ranges (millions of units).....	1.7	4.6	6.9	6.1	7.9	na
Television sets (millions of units).....	Insig	0.5	1.7	3.7	5.7	6.6
Washing machines (electric) (millions of units).....	Insig	Insig	0.9	3.4	4.7	5.2

na Data not available.

*Preliminary estimates.

**Expressed in 1955 prices, except for 1969 entry for chemical equipment, which is in 1967 prices.

***Includes truck cranes, cranes mounted on pneumatic tires, and tower cranes.

U.S.S.R. and the Industrial West has probably been widening.

Despite impressive growth in production, however, there have been substantial problems in the chemical machine building sector arising from the lack of technical know-how and the "crash" basis on which this industry has been expected to produce. The planned product mix has not been forthcoming; the quality of much of the output has been inferior; and difficulties have been encountered in the manufacture of custom equipment. Availability of the metals required for fabrication of equipment has also been a problem; there have been shortages of special steels and alloys, clad metal, and tantalum.

The power equipment industry has substantially increased its output of turbines, generators for turbines, and transformers. Manufacturing methods and techniques for producing electric power equipment generally are similar to those used in the United States and other highly industrialized countries. The U.S.S.R. has lagged behind the United States in the technology of production of thermal-electric power equipment, especially high-temperature and high-pressure equipment. In the fields of hydroelectric generating equipment and high-voltage transmission equipment, however, the U.S.S.R. has developed the most advanced technology in the world.

The construction equipment industry has more than doubled the output of bulldozers and excavators since 1960. Although the U.S.S.R. ranks second only to the United States in world production of construction equipment and produces more than the other Communist countries combined, the industry generally fails to meet the needs of Soviet construction in terms of quantity, quality, and product mix. Much of the equipment is underpowered relative to its weight and is susceptible to frequent breakdowns.

The Soviet machine tool industry is oriented toward serial and mass production of standardized general-purpose machines. Although growth of production has leveled off, the U.S.S.R. still produces larger numbers of these units than the machine tool industry of any other country—206,000 metalcutting machine tools and 42,700 metalforming machine tools in 1969. However, the U.S.S.R. still lags far behind the Industrialized West in the development of specialized machine tools, such as numerically controlled machining centers and automatic transfer lines. The priority position enjoyed by Soviet machine tool builders stems from the major role they play in expanding the nation's industrial production, both civilian and military, and the importance of machine tools in maintaining stocks of machinery and equipment in the transportation, agricultural, industrial, and military sectors of the economy. The U.S.S.R. is a net importer of machine tools, with an increasing share of imports consisting of expensive, high-precision, and specialized machine tools—often embodying advanced Western technology. Soviet exports consist of relatively inexpensive general-purpose machine tools.

The growth in production of petroleum refinery equipment has been impressive in terms of volume, but some of the equipment is low in technical efficiency and shortages of critical components are commonplace. At present, the shortage of secondary refining equipment is critical. Refinery construction takes two or three times as long as in the United States, and the equipment installed sometimes becomes obsolete before a refinery is completed. Thus, in production of refinery equipment, as in other branches of machine building that produce for the newer and more rapidly expanding industries of the economy, output fails to satisfy requirements in terms of economic productivity.

2) Shipbuilding—The U.S.S.R. is one of the major shipbuilding nations of the world. In 1960-69 it completed approximately 807,000 naval standard displacement tons of major combatant ships, including submarines, and about 3,973,000 deadweight tons (d.w.t.) of merchant ships. Most of the ships were built for Soviet fleets, although a small number of merchant ships have been exported to other Communist and non-Communist countries. The U.S.S.R. also supplies most of the naval ships to the Eastern European Communist countries and in recent years has transferred naval ships to Yugoslavia and Cuba and to less-developed nations in North Africa, the Middle East, and Asia.

Despite efforts to streamline domestic shipbuilding with the goal of becoming less dependent on foreign shipyards for merchant ship construction, the Soviet shipbuilding industry remains too small to support both the present rate of expansion of its merchant fleet—even though the annual rate of growth for the fleet has declined steadily since 1965, with the lowest level of the decade recorded in 1969—and the construction of naval ships.

In 1960-69, dry cargo ships accounted for some 44% of Soviet merchant ship completions in terms of deadweight tonnage; tankers accounted for 37% (Figure 128). The Soviets also built substantial tonnage of refrigerator ships, factory trawlers, and other fishing ships, as well as specialized vessels such as tugs, icebreakers, and hydrofoils. In contrast, nearly two-thirds of the merchant tonnage completed by other Communist countries for the U.S.S.R. were dry cargo ships. Half of the tonnage imported by the Soviets from non-Communist countries consisted of tankers, and one-third consisted of dry cargo ships.

Poland and East Germany were the major foreign producers of dry cargo ships for the U.S.S.R. in these years, supplying about 1,320,000 d.w.t. and 850,000 d.w.t., respectively. Completion of significant tonnage for the Soviets by Yugoslav shipyards began in 1964, and in the period 1964-69 they completed almost 356,000 d.w.t. of dry cargo ships and in 1965-69 some 390,000 d.w.t. of tankers. Poland and Bulgaria also have supplied some tanker tonnage.

The largest non-Communist builder of dry cargo ships for the U.S.S.R. is Finland (about 711,000 d.w.t. in 1960-69), followed by Japan and Denmark (about

25X1

FIGURE 128. MERCHANT SHIPBUILDING BY AND FOR THE U.S.S.R.
(Number of vessels built and deadweight tons (d.w.t.) 1960-69)

TYPE OF VESSEL	IN U.S.S.R.		IN OTHER COMMUNIST COUNTRIES		IN NON-COMMUNIST COUNTRIES		TOTAL	
	Number of vessels	D.W.T.	Number of vessels	D.W.T.	Number of vessels	D.W.T.	Number of vessels	D.W.T.
Dry cargo...	255	1,737,173	378	2,710,943	141	951,621	774	5,399,737
Tanker.....	69	1,472,980	59	712,920	85	1,268,553	213	3,454,453
Passenger...	8	4,432	30	44,502	na	na	38	48,934
Fishing.....	375	749,700	272	634,160	83	448,963	730	1,832,823
Other*.....	18	8,600	24	24,286	29	46,414	71	79,300
Total.....	725	3,972,885	763	4,126,811	338	2,715,551	1,826	10,815,247

na Data not available.

*Other includes salvage tugs, icebreakers, cable layers, training ships, hydrographic ships, and dredgers.

110,000 d.w.t. each). Large tankers have been imported mainly from Japan (710,000 d.w.t.) and Italy (335,000 d.w.t.). During 1960-69 Finland supplied nearly 240,000 d.w.t. of small tankers (average size 4,400 d.w.t.). Poland, East Germany, and West Germany were the major suppliers of fishing ships, but significant additional fishing ship tonnage was supplied by Japan, Sweden, and Denmark.

3) Civilian Motor Vehicles—The U.S.S.R. lags far behind other major industrial nations in the production of civilian motor vehicles. In 1969 Soviet passenger car production (293,600 units) was less than 4% of the 8.2 million produced in the United States; there was only one passenger car per 184 persons in the U.S.S.R. compared with one per 2.4 persons in the United States in 1968. Trucks and buses (550,700 units in 1969) account for 65% of the number of Soviet vehicles produced; in contrast, 81% of the vehicles produced in the United States are passenger cars. The Soviet plan for 1966-70 stressed the expansion of passenger car production. Total output of cars was to quadruple by 1970, with part of the planned output of 700,000 to 800,000 cars scheduled to come from the new Volga Motor Vehicle Plant at Tol'yatti under contract with FIAT; this national goal was later lowered to 600,000 cars. In mid-plan, the Soviets also began to push harder to build up the truck industry. They raised the plan goal to 750,000 trucks by 1970 (from the original goal of 600,000 to 650,000 trucks) and began the construction of a large new plant on the Kama river for building heavy diesel trucks, to be completed in 1974 or 1975. In spite of considerable progress during the 5-year plan period, the industry fell considerably short of meeting either the original or revised goals. According to the annual plan for 1970, motor vehicle production was expected to reach 922,000 vehicles—527,000 trucks, 348,000 cars, and 47,000 buses. This represented only about 65% of the total number of vehicles called for in the original 1966-70 plan.

Automobiles will continue to be scarce in the near future and available only to the relatively prosperous or

to the politically favored. Service facilities, woefully inadequate at present, are to be expanded and modernized; however, it is unlikely that the expansion will keep pace with passenger car and truck production and the needs of a growing Soviet propensity for touring.

Despite the present shortage of passenger cars, the U.S.S.R. exports more than one-fourth of the cars that it builds; some 82,300 were exported in 1968, more than three-fourths of which went to the Eastern European Communist countries. The market for automobiles in the Communist countries is great, and there is little prospect that the Soviets will increase substantially their export of cars to non-Communist countries. Exports of trucks are small in relation to production, and imports of motor vehicles are negligible.

Until recently the U.S.S.R. has been capable of supplying most of the raw materials required by its motor vehicle industry from domestic sources. The expansion of the industry to boost the output both of passenger cars and trucks now is straining present supplies of some materials. For example, the U.S.S.R. is not yet capable of producing enough auto body steel or other high-quality steels and will continue to buy these materials from West Germany, the United States, and other countries, as it has done for the past 2 years. In addition, deficiencies in the supply of parts and components is a chronic problem that sometimes delays the production of new vehicles and continually idles a large part of the Soviet vehicle park. The primary producers of motor vehicles, such as the Gor'kiy Motor Vehicle Plant (GAZ), have in the past made most of their own major subassemblies such as engines, transmissions, and differentials, but the building of these and many other parts and components now is being shifted to subsidiary producers on an increasing scale. The new passenger car plant at Tol'yatti has required the building of a number of new supplier plants, several with the help of Western firms, and agreements have been signed with five different countries in Communist Eastern Europe for supplies of parts on a continuing basis.

Although the Soviet motor vehicle industry has attained a high degree of mechanization, many of the machine tools in service are worn or obsolescent. Automation is less advanced, but some automatic transfer machine tool lines are in operation, principally for the manufacture of engine blocks, pistons, and other engine parts. The state of technology in the industry is being advanced by the construction of the Volga Motor Vehicle Plant under the FIAT contract and expansion of production facilities for the Moskvich automobile under contract with the French firm Renault. Both facilities embody Western production technology and equipment, including gearcutting machinery and crankshaft grinders from the United States. Although delays in reaching agreement on technical specifications and the rigidity of Soviet contracting procedures contribute to the slippage in Soviet schedules, the relatively high priority of these projects appears to assure their success.

4) Other Consumer Goods—The output of consumer durables expanded rapidly from 1950 to 1969. Particularly noteworthy was the development of a large-scale TV industry and of capacities to produce refrigerators, vacuum cleaners, and washing machines. Many durable goods, however, are still made in machine building plants that primarily manufacture heavy equipment. For example, the Moscow Motor Vehicle Plant *imeni* Likhachev (ZIL) produces refrigerators in addition to its primary line of motor vehicles.

Although the production of some durable consumer goods has increased rapidly, many goods are still not available to the average household. Radios, TV sets, and wristwatches are plentiful, but supplies of electrical household appliances such as refrigerators and washing machines still fall short of demand. The following tabulation compares the 1969 Soviet output of selected household durables with that of the United States, in units per thousand people:

	U.S.S.R.	UNITED STATES
Washing machines	22	22
Refrigerators	15	28
TV sets	27	55
Radios	30	110

This comparison, however, is only a partial indication of the real difference in the availability of appliances in the two countries. Millions of homes in the United States are already equipped with all of these appliances, while the great majority of homes in the U.S.S.R. are without them. In addition, most Soviet appliances resemble those available to Western households 20 to 30 years ago.

In comparison with most other branches of the machine building sector that also produce durable consumer goods, the Soviet clock and watch industry is outstanding. With several large factories as the core of its horological industry, the U.S.S.R. has become a major world producer of timepieces. The workmanship of timepieces is rated high by U.S. technicians, and watches are an important export item. The Soviet Union

is also a net exporter of other durable consumer goods such as radios, TV sets, refrigerators, and washing machines.

b. CHEMICALS AND ALLIED PRODUCTS

(1) *General*—The Soviet chemical industry is the second largest in the world, being about one-third the size of its U.S. counterpart. Large reserves of important chemical raw materials such as salt, limestone, petroleum, phosphate, potassium, and sulfur-bearing ores provide a strong base for its development. Although production of chemicals has been growing rapidly, overall progress has been impeded by lags in the introduction and assimilation of modern chemical technology; nevertheless, the U.S.S.R. is making a major effort to overcome present shortcomings and to catch up with the leading industrial countries of the West in the production and application of a wide range of new chemical products. This effort involves not only the acquisition of advanced chemical technology and equipment for production of petrochemicals and complex products, such as synthetic fibers and multinutrient fertilizers, but also a significant expansion in the production of such basic chemicals as sulfuric acid and caustic soda.

During 1950-58 the chemical industry was relatively neglected, ranking last among the major branches of the manufacturing sector in the allocation of gross fixed investment. In May 1958 Khrushchev announced the adoption of a program to accelerate development and modernization of the chemical industry during 1959-65. As a consequence, the share of the chemical industry in total industrial production rose from 4.3% in 1958 to 5.8% in 1965. Data concerning production of selected chemicals and allied products are shown in Figure 129. Despite the substantial increases in production, delays in construction and difficulties in bringing new plants up to rated capacity prevented realization of the plan to triple chemical output during the 1959-65 period. Shortfalls were particularly evident in sectors producing fertilizers, plastics, synthetic rubber, and manmade fibers.

In December 1963, when it was evident that chemical industry goals for 1965 were out of reach, Khrushchev unveiled a new 7-year program for "chemicalization" of the economy during 1964-70. The chemical industry was again called upon to satisfy the growing needs of industry, agriculture, and the consumer sector. Ambitious targets were set for 1970, but these were reduced following the removal of Khrushchev from office in 1964. Despite the reduction, chemical output was scheduled to double during 1966-70, a rate of growth well above that for all industry. Continuing difficulties, however, were experienced in construction and operation of new installations; plans for the production of fertilizers, plastics, manmade fibers, and a number of other products in 1970 were again reduced. In addition to the impact on growth, the lag in commissioning modern facilities has adversely affected the efficiency of the chemical industry and the quality of its products.

FIGURE 129. PRODUCTION OF BASIC CHEMICALS AND ALLIED PRODUCTS
(Thousands of metric tons)

	1950	1955	1960	1965	1968	1969*
Caustic soda (100%).....	299	518	704	1,119	1,525	1,668
Chemical fibers.....	24	110	211	407	554	583
Chlorine**.....	187	322	496	833	1,118	1,243
Mineral fertilizers***.....	5,497	9,668	13,867	31,253	43,469	46,000
Nitric acid (100%)**.....	892	1,498	2,417	4,300	5,850	na
Plastics.....	67	160	312	803	1,291	1,452
Soda ash (100%).....	711	1,365	1,793	2,727	3,128	3,289
Sulfuric acid (100%).....	2,125	3,798	5,398	8,518	10,159	10,664
Synthetic rubber**.....	144	240	347	570	725	790

na Data not available.

*Preliminary.

**Estimated.

***Fertilizer quantities are expressed in terms of fertilizer containing the following nutrients: 20.5% N.; 41.6% K₂O; 18.7% P₂O₅.

Development of the industry is hindered by lack of know-how and experience in chemical engineering, a shortage of skilled personnel, and the inability of the machine building industry to provide equipment that meets requirements for both product mix and quality. Nevertheless, expansion of the chemical industry is likely to remain a relatively high priority because of the heavy dependence of modern industrial and agricultural technology on the wide range of chemical products developed since World War II.

The U.S.S.R. imports raw materials and intermediates for the production of chemical fibers, plastics, and synthetic rubber, and also purchases lacquers and photographic materials. In addition, large quantities of natural rubber, pharmaceuticals, and pesticides are imported. The most important chemical exports are fertilizers, raw materials for fertilizers and plastics, coke chemicals, synthetic rubber, and rubber products. On a value basis, trade in chemicals, rubber, and allied products (including pharmaceuticals, chemical fibers, and essential oils) amounted to more than 6% of total Soviet foreign trade in 1968. Imports exceeded exports by almost 400 million rubles (some US\$440 million), with imports of natural rubber alone totaling 104.8 million rubles.

(2) *Production*—Gross chemical output, originally scheduled to double during 1966-70, increased by 57% during the first 4 years of that 5-year plan. In 1969, chemical output increased by 10%, the lowest annual rate during the plan period. Nevertheless, growth rates for chemicals have remained well above those for all industrial output and, despite the shortfall in plans, substantial increases have been made in production of fertilizers, plastics, and a number of other products. Centers of chemical production are shown on the Summary Map, petroleum refining and chemical industry inset (Figure 187).

Sulfuric acid is produced at more than 75 plants in the U.S.S.R., but output is insufficient to meet requirements, particularly those of the phosphate fertilizer industry. Soviet plans for 1966-70 called for

production of sulfuric acid to rise from 8.5 million tons in 1965 to 15.6 million tons in 1970. Delays encountered in building new installations and in operating them at rated capacity, however, resulted in production of only 10.7 million tons in 1969. To overcome present shortcomings, adoption of improved production processes and equipment and increases in the size of future production units are planned. Poland contracted to supply the U.S.S.R. during 1969-70 with three large sulfuric acid installations that incorporate Western technology and have production capacities of about 360,000 tons each per year.

Synthetic ammonia and nitric acid are important primarily in the manufacture of nitrogen fertilizers but are also used in the manufacture of explosives and propellants. Soviet technology for production of ammonia lags behind that used in modern Western plants, and plans for 1971-75 call for construction of installations with unit capacities of 400,000 to 500,000 tons per year that are to utilize more efficient designs and equipment. Production of both ammonia and nitric acid is growing rapidly, although delays in construction and technical development have caused shortfalls in production targets. The output of ammonia was scheduled to more than double during 1966-70; the actual increase during 1966-68 probably amounted to about 50%. Production of nitric acid is not growing as fast as production of ammonia but continues to expand fairly rapidly to meet the rising needs of the fertilizer industry.

The manufacture of fertilizers is one of the most important functions of the Soviet chemical industry. Plans initially called for production of fertilizer to double during 1966-70 and to reach 62 million to 65 million tons¹⁹ per year, but the goal for 1970 was later reduced to 57.5 million tons. Implementation of a plan to double fertilizer production capacity during the 5-year period 1968-72 is also behind schedule. In addition

¹⁹Expressed in terms of Soviet "standard" fertilizer. The 62 million to 65 million tons would be roughly equivalent to 14 million to 15 million tons of fertilizer nutrients.

to the delays experienced in increasing output, the Soviet chemical industry has been very slow to improve the product mix and the quality of fertilizers. Production is heavily weighted with single-nutrient fertilizers, while the more efficient complex or multinutrient types common in the West account for only 6% of total Soviet fertilizer. Production of fertilizer is scheduled to increase to an annual rate of at least 90 million tons by 1975. To achieve this goal the U.S.S.R. has purchased several large complex fertilizer plants from Western firms as well as ammonia plants both from firms in non-Communist countries and from Czechoslovakia. Czechoslovakia also has contracted to supply three large urea fertilizer plants to the U.S.S.R. and, jointly with Poland and East Germany, a superphosphate plant.

The Soviet Union ranks second in the world in the production of synthetic rubber, although output is only about one-third of that in the United States. The U.S.S.R. is also the world's second largest consumer of rubber. Confronted by increasing demands for rubber and handicapped by a synthetic rubber industry that has failed to keep pace with these demands, the country has been forced to import sizable quantities of natural rubber—primarily from Malaysia. Soviet imports of natural rubber from all areas averaged 273,000 tons per year in 1959-65 and about 296,000 tons per year during 1966-69.

Soviet plans initially called for production of synthetic rubber to rise by 120% during 1966-70. Largely because of delays in development and commercialization of new types of synthetic rubber, however, the planned increase was reduced to 51%. Most of the growth in output during 1966-69 nevertheless resulted from increases in production of two relatively new types of synthetic rubber, polyisoprene and polybutadiene. Their share in total Soviet production of synthetic rubber rose from 4% in 1965 to 26.7% in 1969. At least one-third of the synthetic rubber produced in 1968 was made by an obsolete process using ethyl alcohol.

About three-fourths of the synthetic rubber made in the U.S.S.R. goes for production of tires and technical rubber goods. The quality of these products, although steadily improving through the 1960's, still lags behind that of the developed Western countries. Soviet efforts to reduce this lag include the use of improved types of rubber, cord, and carbon black, and increased production of radial tires.

The U.S.S.R. ranked fifth in the world in the production of plastics in 1969, output being a little less than one-fifth of that in the United States. An ambitious Soviet program to produce 2.1 million to 2.3 million tons of plastics by 1970 had to be abandoned. Nevertheless, production has been rising rapidly, and the revised 1970 target—1.63 million tons—represented a doubling of the 1965 output. Manufacturing techniques and the assortment and quality of Soviet plastics have been generally inferior to those in the United States and

Western Europe. To compensate for inadequacies in domestic production, the U.S.S.R. imports both finished plastics and materials used in their production. Process technology and a number of complete plastics plants have been purchased from firms in non-Communist countries in an effort to achieve a greater degree of self-sufficiency.

Soviet production of manmade fibers (cellulosic and synthetic) in 1969 amounted to about 23% of the amount produced in the United States. Such fibers represent about 20% of the total Soviet output of textile fibers, a far smaller share than in the United States. Production of manmade fibers in the U.S.S.R. increased by 43% during 1966-69. This performance included an increase of 84% in production of synthetic fibers. The quality of some Soviet manmade fibers is very poor by U.S. standards, partly reflecting the use of inferior raw materials. In addition, the assortment is not adequate to provide for the needs of the textile industry. To compensate for its lagging technology, the U.S.S.R. has purchased plants and technology from the non-Communist world for the production of polyester (Dacron) and acrylic fibers and of associated intermediates.

C. TEXTILES AND WEARING APPAREL

(1) *General*—The output of light industry (textiles and wearing apparel) in the U.S.S.R. has increased appreciably in recent years, but the assortment and quality of output remain low by Western standards and fail to meet the increasingly exacting demands of the Soviet consumer. In an effort to solve these problems the industrial reforms adopted in 1965 permitted enterprises in light industry to key production to sales at retail outlets. As a result, a somewhat better matching of supply and demand for textiles and wearing apparel has occurred, and the rapid inventory growth characteristic of the first half of the 1960's has reversed. However, prices of textiles and wearing apparel remain generally high relative to those of comparable goods in the West.

The major share of Soviet soft goods is produced in large centrally directed plants which generally use mass production methods. Some items, however, continue to be produced on a small scale by local industry, which now includes many former industrial cooperative enterprises that operated outside the state sector of the economy until 1960. Using local materials and scrap from large-scale industry, local industry plants produce a wide variety of goods, mainly for local needs.

Technological improvements in light industry have been slow to develop and consequently a great deal of labor is used. Even in the textile industry, which is more highly mechanized than the clothing and footwear industries, many more workers are used for given operations than in the United States. Throughout light industry, machinery is overage; Soviet textile mill equipment is 25 to 30 years behind that of the United States. Machinery designers and manufacturers have been slow to respond to the needs of the sector for more

efficient and sophisticated equipment. In order to speed modernization of plant and equipment, the Soviet Union has turned to Western countries for purchases of machinery and manufacturing processes of advanced design.

Although Soviet foreign trade in textiles and wearing apparel is increasing, it is small compared with domestic production. In 1968 net imports by value of textiles and wearing apparel amounted to slightly over 1 billion rubles; nearly one-fourth of this was for leather footwear.

(2) *Production*—Soviet production of textiles and of major items of wearing apparel has grown steadily since 1955 (Figure 130). The textile industry is by far the largest single component of light industry. Cotton fabrics continue to dominate textile production, constituting 72% of total textile production in 1968. The production of cloth from chemical fibers and natural silk ranked second to cotton cloth in volume but accounted for only 11% of total Soviet textile production in that year. Woolen cloth accounted for 7% of textile output; the remainder consisted of linen, jute, and hemp fabrics.

Production of footwear has increased significantly since 1955, but the output does not satisfy demand. The industry suffers from an inadequate supply of domestic leather. Although use is made of textile materials as well as artificial and synthetic leathers in the manufacture of shoes, the production of these materials also lags behind the growing requirements of the industry. Consequently, there are net imports of finished footwear, leather (tanned leather, raw hides, skins), and artificial leather. A significant part of all work in the manufacture of shoes in the Soviet Union is done by hand, while the footwear industries of the countries of the Industrial West are highly mechanized. Despite numerous improvements, Soviet footwear varies widely in style, quality, and materials. By Western standards, Soviet footwear is of inferior quality with respect to materials and details of construction.

d. CONSTRUCTION AND CONSTRUCTION MATERIALS

(1) *Construction*—Almost 60% of Soviet investment goes into construction (including assembly and installation work). In 1968, 85% of total construction was performed by state organizations; the balance was performed by collective farms and by private individuals who built their own homes. Following a period of very rapid growth in total construction work between 1955 and 1960, when the average annual rate of growth was about 13.5%, a pronounced slowdown occurred during the early 1960's. Between 1960 and 1963, the average annual growth rate was only 1.6%. During 1964-68, however, growth in construction recovered to an average annual rate of 7.3%. In 1968 investment in construction claimed about 15% of Soviet GNP.

Soviet leaders have been liberal in approving lists of construction projects submitted for inclusion in the national economic plan. Because of this openhandedness, the number of projects in progress has proliferated to the point where construction resources are spread thin, and the time required to complete projects is stretched out over an unduly long period. As shown in the following tabulation, the average rate of growth in percent of the so-called volume of unfinished construction has increased much faster since 1960 than the rates of either investment in construction or completions of construction projects (as measured by "gross additions of new fixed capital"):

	1961-65	1966	1967	1968
Volume of unfinished construction	6.7	9.6	10.0	14.9
Investment in construction	3.9	7.2	8.0	6.8
Gross additions of new fixed capital	6.5	7.1	8.8	3.3

As a result, vast sums of capital are now tied up in unfinished construction projects (41 billion rubles in 1968). The delays in completion of new projects also slow the introduction of new technology; the longer the construction time, the more obsolete new plants are apt to be when finally completed.

Although Soviet authorities acknowledge the generally poor quality of construction, improvements in

FIGURE 130. PRODUCTION OF TEXTILES AND WEARING APPAREL

	1955	1960	1965	1968	1969
Textiles:					
Cotton (billions of square meters)	4.227	4.838	5.499	6.116	6.210
Wool (billions of square meters)	0.316	0.439	0.466	0.585	0.617
Linen (billions of square meters)	0.272	0.516	0.548	0.675	0.674
Other (billions of square meters)*	0.532	0.843	0.959	1.093	na
Wearing apparel:					
Knitted outerwear (millions of pieces)	85	112	188	303	363
Knitted underwear (millions of pieces)	347	472	718	825	820
Hosiery (millions of pairs)	772	964	1,350	1,466	na
Sewn garments (billions of new rubles)**	na	8.7	9.2	13.4	14.4
Leather footwear (millions of pairs)	271	419	486	598	635

na Data not available.

*Silk, synthetic, jute, and hemp fabrics.

**In 1955 wholesale enterprise prices.

25X1

recent years have been almost negligible. Extreme pressure simultaneously to reduce costs and to increase the volume of construction is probably the major barrier to improvements in quality. Also, a number of deficiencies in construction tools and equipment contribute to the problem; there is a general shortage of handtools at most construction projects, and Soviet construction machinery falls considerably short of the best in design and performance. Furthermore, the construction industry suffers from a large labor turnover, a factor which contributes to the lack of professionalism. Finally, delays in getting materials and equipment to construction sites break the rhythm of the construction process, and uncompleted projects are common.

(2) *Construction materials*—Emphasis on “industrialization of construction” and on the use of standardized designs, particularly in housing and other civilian construction, has made the Soviet Union the world’s largest producer of cement and precast concrete products and a leader in shifting construction work from the field into factories where components such as large wall panels are prefabricated. The production of major construction materials is shown in Figure 131. The change in the mix of construction materials is shown in the following tabulation of the share, in percentages, of various materials in gross value of production:

	1955	1968
Cement	6.2	9.7
Precast concrete*	5.5	31.3
Wall materials**	13.8	9.4
Rock products	7.3	7.0
Construction steel	13.7	16.6
Construction lumber	38.4	12.7
Other materials***	15.1	13.3

*Includes precast concrete wall panels and pre-stressed concrete components.

**Includes all masonry construction materials used for walls except reinforced concrete and prefabricated panels.

***Includes flat glass, tile, soft roofing, refractories, sanitary technical equipment, and the like.

The production of precast concrete components has grown even more rapidly than planned, but there have been drawbacks in the program that apparently were not anticipated. As a result of the emphasis on greater use of precast concrete wall panels, the production of brick was prematurely curtailed; consequently, when

the wall panel production program ran into snags, there was a shortage of wall materials and a belated recognition of the primary importance of brick for masonry wall material. Another discouraging feature of the program has been the excessive maintenance required for structures built of precast concrete components because of the poor quality of the concrete—the result of having to scrimp on cement and using rock products of low quality in mixing concrete aggregates.

e. *FOOD PROCESSING*—In terms of quality, variety, and packaging, the food industry of the U.S.S.R. lags far behind that of the United States and Western Europe. Industrially processed meat, canned goods, and beer are of particularly low quality. Industrially processed milk, butter, vegetable oil, and margarine are still largely retailed in bulk form. Few foods are prepackaged, and foods that are precooked or frozen are almost unknown to the Soviet consumer. Processing facilities for most agricultural products are insufficient, and storage, transport, and refrigeration facilities are far from adequate.

The growth of output of the food industry has been primarily dependent upon the level of agricultural production, but the availability of some nonagricultural resources such as the domestic fish catch and imports of raw materials—especially sugar—also contributes to the growth rate. In addition, institutional change has been important; for example, the shift from home processing to industrial processing has stimulated growth. This has been particularly true in the meat industries where the share of total output accounted for by industrial processing rose from 37% of total meat production in 1950 to 65% in 1968. The industrial production of other food commodities has followed a similar pattern of change, as illustrated in the following tabulation (based on U.S. official production estimates) showing industrial processing as a percent of total production for selected food products.

YEAR	MEAT	MILK PRODUCTS	BUTTER	FLOUR
1950	37	32	70	65
1955	44	40	81	81*
1960	60	55	87	90
1965	59	65	91	95*
1966	61	64	90	95
1967	64	63	90	na
1968	65	64	90	na

*Estimated.

FIGURE 131. PRODUCTION OF PRINCIPAL CONSTRUCTION MATERIALS

	1950	1955	1960	1965	1968	1969
Cement (millions of metric tons)	10.2	22.5	45.5	72.4	87.5	89.8
Construction steel (millions of metric tons)* ..	5.1	7.5	12.6	19.6	24.6	na
Construction lumber (millions of cubic meters)* ..	82.2	109.2	127.2	104.2	91.3	na
Precast concrete (millions of cubic meters)	1.3	5.3	32.4	63.1	82.4	na
Rock products (millions of cubic meters)	62.0	174.0	314.0	364.0	432.0	na
Wall materials (billions of standard bricks)** ..	na	25.6	44.5	44.6	50.2	na

na Data not available.

*Estimated.

**Comprises brick, dimension stone, and block.

25X1

Over the long run, the exhaustion of possibilities for further growth through the substitution of industrial processing for home processing of products such as butter and flour has been a decelerating factor in the overall growth of the food industry. More importantly, however, growth of the output of the food industry has fluctuated with growth in the supplies of crop and livestock raw materials. For example, the average annual rate of growth during 1965 to 1968 was nearly 8%, but in 1969 the growth rate fell to 4%, due mainly to the unusually difficult winter.

C. Government economic policy and finance

1. Goals and policies

Since the beginning of comprehensive economic planning in the U.S.S.R. in 1928, the primary goals of Soviet economic policy have been rapid industrialization of the economy and the development and maintenance of a strong military establishment. The leadership has pursued—with a high degree of success—rapid rates of growth in industry, not only to provide military might but also to support foreign policy by increasing the international prestige of the Soviet Union in economic competition with capitalist nations.

Stalin's successors have introduced no basic change in economic policy. They have had to make important decisions, however, about the most effective means of pursuing the goals of rapid growth. Thus, since 1953, consumption has been given a somewhat higher priority than the very low one accorded it during the 1930's and 1940's. Both the Malenkov and Khrushchev regimes believed that economic incentives in the form of additional goods, services, and leisure were necessary to raise labor productivity and maintain high rates of growth. But the principal means of achieving high rates of growth continued to be a rapid increase in investment (especially in heavy industry), an increase in the average level of educational attainment of the labor force, and emphasis on the introduction of new technology. The post-Khrushchev leaders have continued to follow these same policies in pursuit of rapid economic growth and a strong military establishment. Like Malenkov and Khrushchev, they have made gestures to the consumer but have not carried out any fundamental reallocation of resources.

2. Economic control and reform

Nearly all economic activity in the U.S.S.R. is planned and closely controlled by the Communist Party of the Soviet Union (CPSU) and the government. The Politburo of the CPSU Central Committee is the ultimate authority on economic policy, but it relies on the U.S.S.R. Council of Ministers (the highest body of the executive arm of the central government and the apex of the economic administrative structure) to implement policy. Ample assurance that the party's policy will be carried out by the government hierarchy is provided by interlocking membership at the top and by

a strategic distribution of party members in government posts at subordinate levels.

The Supreme Soviet—the highest legislative body—does not initiate economic measures but dutifully signs into law economic directives that have been formulated by the Party Politburo and transformed into operational plans by the Council of Ministers through its several staff organizations. These staff organizations include the State Planning Committee (*Gosplan*), the Central Statistical Administration, the Ministry of Finance, and other more specialized bodies such as the State Committee for Labor and Wages.

Joint party and government control of the economy is enhanced by state ownership of all natural resources and almost all means of production. Most of the Soviet economic product originates in the state sector, and nearly all falls within the socialized sector (the state sector plus the collective farms). A part of total output still originates in the private sector, largely in agriculture and trade where the private share accounts for about 30% and 4%, respectively, of gross output.

Despite a few changes in the formal organization of the economy—most notably the switch in 1957 from functional to geographical lines of hierarchical control—the method of running the economy remained basically unchanged during 1928-65. Until 1957, the enterprises engaged in a particular activity were typically grouped under one of many economic ministries organized along functional lines: for example, the Ministry of Ferrous Metallurgy, the Ministry of Food Industry, the Ministry of Internal Trade, or the Ministry of Transport Construction. Some ministries were completely national in scope, some had republic ministries interposed between them and the enterprises, and still others were limited to republic status. All, however, ultimately were responsible to the U.S.S.R. Council of Ministers and the party Politburo (then known as the Presidium).

In mid-1957 the administration of the economy was reorganized to emphasize the geographical grouping of enterprises in the socialized sector. Except for a few economic ministries in defense-related production and in activities of broad scope, such as communications and transportation, the ministerial system of administration was abolished, and most enterprises were subordinated to "regional councils of the national economy" (*sovnarkhozy*). In the early 1960's, declining rates of economic growth caused Soviet leaders to reexamine the rationale and structure of the country's system of economic planning and management. At the same time, "liberal" Soviet economists were advocating greater decentralization of economic decisionmaking and some autonomy for enterprise managers, enabling them to operate on the basis of value indicators—particularly "profitability" (the ratio of profit to fixed and working capital). Experiments embodying many of the proposals of the liberal economists were initiated at two garment enterprises in July 1964 and subsequently were extended to several hundred enterprises in light industry and even to several in heavy industry.

25X1

The comprehensive reform in Soviet industry announced by the government in September 1965 was based on these experiments. The reform immediately abolished Khrushchev's regional economic councils (*sovnarkhozy*) and reestablished functional industrial ministries. (Figure 104 outlines the ministerial structure of the U.S.S.R. as it was in 1970.)

The principal features of the reform constitute a slight enhancement of the authority of the managerial personnel of individual enterprises and a revision of guides to their decisionmaking. The number of plan assignments imposed upon the enterprise is reduced significantly, and gross value of output is replaced as the principal measure of success by profitability, total sales or total profits (depending upon circumstances), and product assortment. Central control over interenterprise transactions is, in general, retained. In addition, the central organs specify each enterprise's payments into and receipts from the state budget, its wage fund (the total amount of wage payments that it can make during the year), the wage rate for each category of workers, the amount of centrally planned investment, the schedule for putting centrally planned plant and equipment into operation, and assignments for the successful introduction of new production methods.

Retention of earnings by enterprises, formerly a trivial consideration in enterprise management, has been moved to the fore by the reform. Each enterprise is to form cash funds primarily out of its profits with the allocation to these funds depending upon the performance of the enterprise as measured by the new success criteria. The cash funds are to be used to finance bonuses and fringe benefits—such as housing for workers and their families—as well as to provide funds for a portion of investment in the enterprise. The enterprise management is to have substantial freedom in spending the cash funds for their designated purposes. Management is to have considerable autonomy in establishing criteria for the award of bonuses, in determining the mix of fringe benefits, and in initiating investment projects financed internally. Soviet spokesmen have predicted that about 20% of gross fixed investment in industry will be initiated by the enterprises themselves after the reform has been implemented, whereas in the past the enterprises had very little control over investment.

The formation of enterprise cash funds has been facilitated by the revision of industrial wholesale prices that went into effect on 1 July 1967—12 years subsequent to the most recent previous revision. The new prices were intended to be more in line with relative costs and to introduce some elements of return on capital and of rent as price-determining factors; these prices, however, are fixed and are not responsive to fluctuations in demand and cost of production.

Central control over the distribution of supplies among enterprises is to be relaxed gradually. Progressively more details of interenterprise transac-

tions are to be settled by agreement between buyer and seller rather than dictated from the center; moreover, more and more items are to be distributed by relatively free wholesale trade (at centrally established prices). However, these and other changes in the supply system have not been widely adopted, and, given the persistence of inflexible pricing and excessive demand for most goods and services, it is doubtful whether more than minor gains in efficiency will be forthcoming even if these measures are fully implemented.

By 1 July 1970 some 41,400 enterprises, accounting for 92% of output in industry, had been converted to the new system. The reform is being extended to transportation, communications, retail trade, and construction. Soviet statistics indicate that enterprises which have begun to operate on the new system have generally overfulfilled their sales and profits plans, outstripping handily the performance of enterprises not yet converted. However, the record of enterprises that have been operating under the reform for several years indicates that many of them have difficulty maintaining their early pace.

The cost consciousness inspired by the new incentives has apparently resulted in more thrifty use of resources by many enterprises operating under the reform; "reserves" such as hoarded materials and parts have been reduced in some cases. Once these "reserves" were eliminated, however, the increase in the rate of growth attributable to reform faded because the gains from reform did not embody significant improvement toward economically efficient allocation of investment or technological progress. Moreover, backsliding and inconsistent directives have affected the performance of enterprises operating under the reform. For example, the reform contained provisions that were designed to encourage the efficient use of labor. Enterprise managers were given—in theory—a great deal of autonomy in setting the size of the work force, in hiring and firing workers, and in determining wage levels (subject to the limits imposed by the size of the enterprise's annual wage fund). In practice, however, the autonomy of enterprise managers has been constrained both by inconsistent provisions of the reform dealing with incentives and by direct pressure from above. Thus, on the one hand the enterprise manager was granted greater autonomy to spur efficiency, but on the other hand the manager's bonus was tied to the size of the wage fund. The larger the wage fund (that is, the more workers employed), the larger the potential earnings of the manager.

In addition, a variety of direct sanctions and indirect pressure limited the manager's autonomy. For example, management's freedom in the use of labor is still limited by centrally planned lists that prescribe the size of the work force and establish wage rates. Moreover, shortly after the rules of the economic reform were announced, managers were publicly warned not to sack redundant workers. Weaknesses in the reform are recognized and criticized in the press. They have led to experimentation

with new measures designed to increase output while using fewer workers.

The program that has gained the most attention is the so-called Shchekino experiment, named after the chemical combine where the experiment was first introduced. In October 1967 an experiment was begun at the Shchekino Chemical Combine whereby central authorities directed that one out of every seven workers be dismissed by 1970 while the total wage fund at the combine was to remain unchanged at the 1967 level. Under the experiment, when a worker is fired one-half of the wages thus saved is divided among the remaining production workers; the other half is divided among the technical and administrative staffs. Advocates of the experiment claim that the rewards offered are sufficient to overcome reluctance on the part of workers to assume greater workloads and also sufficient to insure that management will seek to eliminate unneeded workers.

The announcements of an increasing number of enterprises transferring to the experiment and a spate of recent laudatory articles suggest that the experiment is picking up steam. But gains in efficiency will be limited even if there is nationwide adoption of the experiment. There will still be a constant temptation for Soviet managers to retain labor reserves. Indeed, Soviet managers, anticipating future manpower cuts as a result of the Shchekino experiment, may increase their efforts to add to current reserves. Increased efficiency, therefore, will be largely the result of fiat on manpower reduction handed down by the ministries. Some additional gains in efficiency, however, may result from improved performance by workers who no longer feel immune from dismissal.

3. Planning

State economic plans are established for monthly, quarterly, and yearly periods, and for periods of 5 years or more. The multiyear plans are elaborated only in sufficient detail to guide economic development along general lines. In contrast, the comprehensive national annual economic plan is the operational guide to current decisionmaking and sets forth in great detail the annual goals for production and distribution, both in physical units and in monetary terms. The quarterly and monthly plans are simply subelements of the annual plan. The annual economic plan also covers employment, costs, expenditures for investment and defense, foreign and domestic trade, and income distribution. A supplementary technical plan elaborates specific changes in inputs of materials and capital required to meet the economic plan, and a financial plan indicates the sources and methods of financing the projected activities. The national plan does not stop at the aggregate national level, however. It contains a breakdown by major territorial subdivision (republic, *oblast*) and by institution (ministry); it also contains provisions for smaller units down to and including the individual enterprise.

The operations of state enterprises are planned in considerable detail. Enterprise management partici-

pates in the planning process, but the basic features of the plan are determined in the hierarchy of planning and supervisory organizations that culminates in the Politburo. In the reformed system, the enterprise is given targets in its plan for the total value of its sales, for total profit, for profit expressed as a percentage return on its capital, and for the production of each of its "basic" products. These targets are to be met in any event and exceeded if possible. The total output of "basic" products specified in the plan usually does not exhaust the productive capacity of the enterprise, and enterprise management can exercise considerable discretion concerning above-plan activities. The plan for an enterprise specifies customers for the bulk of its production and sources for the bulk of its material requirements. Most prices, including wage rates, are fixed centrally, and a number of other matters are decided for the enterprise by higher authorities. Thus, the freedom of action of enterprise managers is circumscribed by the plan. However, gaps in the plan, inconsistencies among plan directives, and incomplete state control over execution of the plan have always had the effect of increasing the freedom of action of enterprise managers beyond that contemplated by the planners.

4. Finance

The essential function of the financial institutions of the U.S.S.R. is to channel the distribution and use of resources in accordance with the economic plan. Handling virtually all transactions between enterprises, providing short-term credit for working capital, and acting as agent of the state in disbursing allocations for capital investment, the banking system is a powerful instrument for influencing the operations of the enterprise. Records of financial flows, moreover, enable the financial institutions to act as a vast inspection organization, policing the enterprises' use of resources to assure compliance with plan directives. The principal financial institutions, in addition to the Ministry of Finance, are the State Bank (*Gosbank*), the Investment Bank (*Stroybank*; literally, Construction Bank), the Foreign Trade Bank (*Vneshtorgbank*), the savings banks, and the Main Administration of State Insurance (*Gosstrakh*).

The State Bank performs limited central banking functions, issuing currency, providing clearing and transfer facilities, and acting as fiscal agent for the various levels of government. As the source of virtually all short-term credit, the State Bank is directly engaged in controlling the flow of economic activity. Unlike central banks in the non-Communist world, however, the State Bank does not exert independent influence over the volume and direction of credit. Rather, it acts as a part of the central bureaucracy in implementing the directives of the economic plan, providing funds to the enterprises to bring about the desired use of resources.

In addition to channeling economic activity by controlling the availability of credit, the State Bank

exercises "control by the ruble" by supervising the activities of enterprises with respect to plan fulfillment and enforcing the application of economic accounting (*khozraschet*). An important feature of this control is the legal requirement that enterprises maintain with the State Bank a "settlement account" (the accounts of construction organizations are maintained with the Investment Bank), and that all interenterprise payments above a certain minimum be effected by transfers between these accounts. It is also required that every order for such a transfer be accompanied by full documentation of the transaction covered, so that the State Bank is enabled to carry on a continuous audit of the current operations of each enterprise. Funds for capital are closely supervised by the Investment Bank, which distributes budgetary investment grants (except in rural areas) and extends long-term credit for investment. Small personal accounts are held by the state savings banks.

The state budget is an important financial instrument for implementing the regime's key economic policies. Most of the budget revenues are derived by setting the prices of the majority of goods at levels higher than costs of production and by appropriating the difference. Some of the difference between prices and costs is accounted for by the turnover tax—essentially a differentiated sales tax on consumer goods—which is scheduled to provide about one-third of total receipts in the state budget for 1970 (fiscal year=calendar year) (Figure 132). The turnover tax on the average comes to over 30% of the value of retail sales. The remainder of the difference between prices and costs consists of enterprise profits, the bulk of which are transferred to the budget.

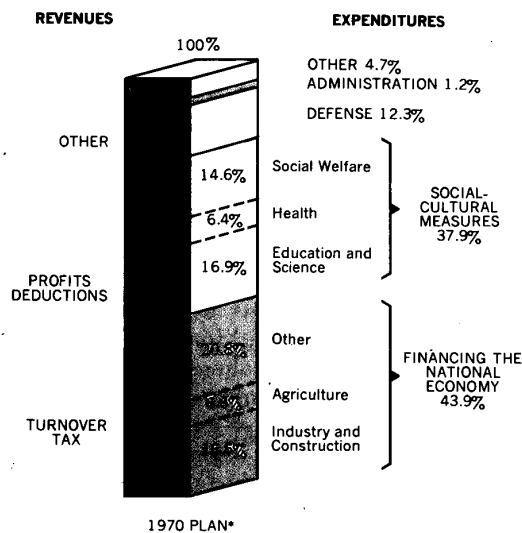
Of total planned expenditures in 1970, 44% were allocated to finance industry, construction, agriculture,

transport and communications, trade, and other activities under the budget category "financing the national economy." This category of expenditures provides funds for the bulk of the fixed capital investment and covers subsidies to enterprises suffering losses, grants to finance planned increases in the inventories and cash balances of enterprises, and other expenditures including price subsidies on agricultural procurements.

Expenditures for social and cultural purposes (including education and science, health, and social welfare) represent the second largest outlay in the state budget, accounting for 38% of total planned expenditures in 1970.

The allocation for defense in the 1970 budget accounted for about 12% of total planned expenditures. In addition to the explicit defense entry, however, other categories of the budget partially or wholly finance defense outlays such as expenditures on security forces and research and development. The space program is mainly financed from the science category of the budget. The size of the state budget and its major components (1970 Plan) are shown in the following tabulation (in billions of rubles):

Revenues	144.9
Turnover tax	46.6
Profits deductions	50.4
Other	47.9
Expenditures	144.7
Financing the national economy	63.5
Industry and construction	23.9
Agriculture	9.5
Transport and communications	2.8
Trade	6.1
Municipal economy, housing, and other outlays	21.2
Social and cultural measures	54.8
Education and science	24.5
Health	9.2
Social welfare	21.1
Defense	17.9
Administration	1.7
Other	6.8
Surplus (rounded to one decimal fraction)	0.3



*Official Soviet Figures

FIGURE 132. Principal components of revenues and expenditures of the state budget (1970 Plan)

D. Trade

1. Domestic trade

25X1

Domestic trade, which includes trade in both producer goods and consumer goods, is an integral part of the planned Soviet economy. Producer goods (raw materials and semifinished and finished goods) are distributed largely through the material-technical supply network, whereas consumer goods are distributed through the retail trade network. Both networks carry on wholesale activities. In 1968 domestic trade employed approximately 7 million people, or about 8.5% of the nonagricultural civilian labor force. Of this number, one-half were engaged in retail trade.

a. PRODUCER GOODS—The State Committee for Material-Technical Supply (*Gossnab*), an organization of the U.S.S.R. Council of Ministers, is the principal

agency that supplies industrial and construction enterprises with raw materials, semifabricates, and equipment. *Gossnab* converts the aggregate distribution plans from *Gosplan* into operational documents which are administered through both central and territorial organs. Twenty-one main administrations (*Glavnabsbyt*) distribute major products such as ferrous metals, nonferrous metals, and oil; 11 other main administrations (*Glavkomplekt*) distribute supplemental equipment and instruments to enterprises under construction or being remodeled. Physical distribution of producer goods is effected by territorial administrations (*GUMTOS* and *UMTS*). These administrations have over 4,000 supply and sales organizations, bases, and trusts which provide materials directly to enterprises and organizations.

There are some distribution activities which are not subordinate to *Gossnab*. A few ministries have material-technical supply administrations which are strictly within the individual ministerial hierarchies. As a rule, they are not involved in the actual distribution of materials but are confined to planning and administrative functions. However, some of these ministries—railways, water and air transport, communications, transport construction, power and electrification, and gas—actively participate in the distribution of goods by operating bases and warehouses. Finally, *Soyuzselkhoztekhnika*, a union republic association, distributes industrial goods such as farm machinery, fertilizer, and construction materials directly to agriculture through local organizations.

b. CONSUMER GOODS—Consumer goods are distributed through two distinct channels—state-controlled stores and the collective farm markets. The state-controlled retail outlets account for 96% of all retail trade (Figure 133). The collective farm markets, accounting for the remaining 4% of retail trade, are subjected to a minimal amount of indirect state influence through local trade administrations which appoint market directors and sanitary inspectors and through the purchasing and pricing policies in the state-controlled sector.

(1) *State-controlled stores*—The state-controlled retail trade network is divided into two separate

systems—state stores, which accounted for approximately two-thirds of total retail trade in 1968, and consumer cooperatives, which accounted for roughly 30%. In addition to retail outlets, both systems also operate public dining outlets, which range from snack bars to restaurants.

(a) *STATE STORES*—The network of retail outlets is supervised largely by the U.S.S.R. Ministry of Trade. The ministry operates specialized food and nonfood stores as well as general food and large department stores. Roughly two-thirds of state-controlled retail sales are accounted for by outlets of the ministry. Public dining outlets operated by the Ministry of Trade account for more than half of the total public dining turnover.

Worker supply organizations (*ORSY* and *prodsnaby*) are part of the state store system independent of the Ministry of Trade. These stores are attached directly to producing enterprises—usually in remote areas where restaurants and retail stores are inadequate. For workers in selected priority industries, the organizations serve the additional function of providing goods not usually available in regular stores. These supply organizations account for roughly one-fifth of total state retail trade.

There are also a number of state agencies that have established specialized distribution networks for their products. For example, the Ministry of Health has retail outlets for the sale of drugs, medicines, and associated products; the Ministry of Communications distributes and sells newspapers and periodicals; and the Ministry of Culture operates bookstores.

(b) *COOPERATIVE STORES*—Consumers' cooperatives constitute a separate trade network, paralleling that of the state stores but designed primarily to service rural areas. These societies are usually composed of residents from a single village. Their primary function is to establish and to run local stores and restaurants. In 1968, the cooperatives had a membership of over 57 million people and operated 366,000 trade enterprises and 65,300 cafeterias and restaurants. In recent years, the number of outlets has increased, but the number of societies has decreased. Nominally, the cooperative system is controlled by its members, but the government actually exercises strict control over products sold, prices, and earnings.

(2) *Collective farm markets*—Collective farm markets provide sales outlets for surplus commodities retained by collective farms after obligatory state deliveries; for produce derived from individual private plots; and for some nonagricultural goods produced by individual craftsmen. The products sold in the collective farm markets are generally of relatively high quality, and prices, which are largely determined by supply and demand, are usually higher than the fixed prices found in state stores. The collective farm markets represent an important source of supply for urban residents. In 1968, although food sales on these markets only accounted for 5% of total retail sales of food, they played a significant role in supplying the population with various items that

FIGURE 133. STATE, COOPERATIVE, AND COLLECTIVE FARM MARKET RETAIL SALES
(Billions of rubles)

YEAR	TOTAL SALES	STATE AND COOPERATIVE SALES			COLLECTIVE FARM MARKET SALES
		Total	State	Cooperative	
1950.....	40.9	36.0	26.1	9.9	4.9
1955.....	55.0	50.2	34.7	15.5	4.8
1960.....	82.3	78.6	54.9	23.7	3.7
1965.....	108.4	104.8	73.8	31.0	3.6
1968.....	138.0	134.2	94.2	39.9	3.8

NOTE—Figures include public catering which amounted to 12.7 billion rubles in 1968.

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are normally in short supply in state stores—perishable foods such as eggs (20% of all retail sales), meat (10%), and milk (10%). Even larger proportions of retail sales of fruits and vegetables are sold on the collective farm markets.

2. International economic relations

a. INTRODUCTION—The foreign trade turnover of the U.S.S.R. (imports plus exports) has grown rapidly as a result of Soviet efforts to weld together an economic bloc in Communist Eastern Europe, to profit from Western technology, and to expand Soviet influence in non-Communist countries as well as in other Communist countries. In the period 1960-69, Soviet foreign trade almost doubled—from US\$11.2 billion to almost \$22 billion—and the average annual rate of growth of 7.8% was comparable with the average annual growth rate for world trade. Performance, however, has been uneven over the period, with a sharp decline in the growth rate in 1965-66 but a growth rate in 1967-69 greater than the average for the decade. The U.S.S.R. is now eighth in the list of the world's trading nations, even though foreign trade is small in relation to the size of the Soviet economy (equivalent to roughly 5% of the GNP).

b. FOREIGN TRADE POLICY, ORGANIZATION, AND CONTROL—The planning of foreign trade is an integral part of Soviet national economic planning. Foreign trade policy is formed on the basis of the imports needed to meet the requirements of the economy and the exports needed to finance imports and other external obligations.

Soviet policies are designed to insure that most Soviet requirements for foreign goods are met from production within the Communist world. About two-thirds of Soviet foreign trade is conducted with other Communist countries, and most of this trade is with Communist Eastern Europe. Trade with the Eastern European Communist countries is achieved largely through bilateral agreements. Some trade is conducted through the Council for Mutual Economic Assistance (commonly known as CEMA or COMECON). CEMA was ostensibly formed to coordinate the external economic relations of its members and to foster specialization of production among the Eastern European Communist countries. Progress toward this goal has been slow, however. In part, the effort was thwarted by the rising tide of nationalism that occurred in some Eastern European Communist countries in the early 1960's. Furthermore, the U.S.S.R. has been unwilling to accept any formula which effectively diminishes its economic and political control over Communist Eastern Europe or significantly increases the costs of maintaining such control.

Efforts to further economic integration have not ceased, however. In July 1970, the member countries of CEMA, with the exception of Romania, signed an agreement founding an International Investment Bank. The bank's primary function will be the financing of

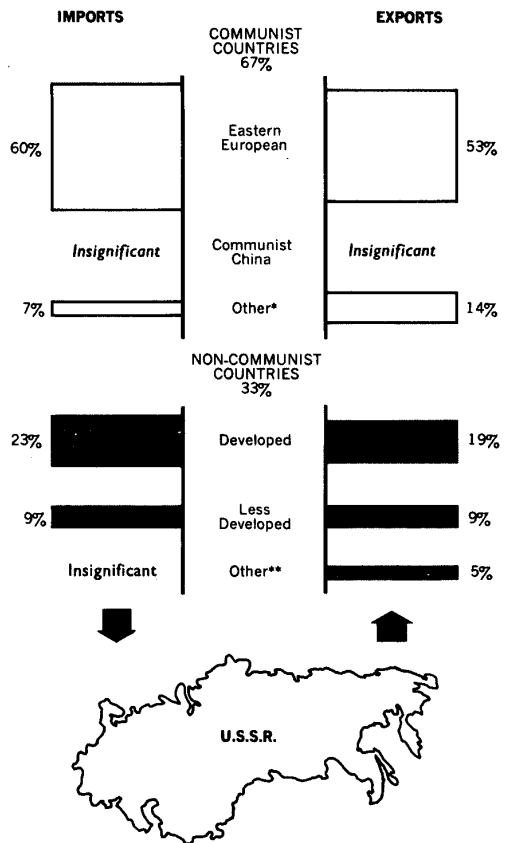
major investment projects within the member countries which are believed to be of benefit to most of its members. The bank will also have a special fund for the granting of credits and technical assistance to developing countries. But, the bank is not expected to begin operating before 1971, while initial funds scheduled by 1972; moreover, Romania's refusal to participate may well undermine the bank's efforts.

Soviet policy toward trade with the non-Communist world is aligned with the pursuit of economic and political goals. The one-third of Soviet foreign trade conducted with the non-Communist world is divided roughly between the developed countries—two-thirds—and the less-developed countries—one-third. The U.S.S.R. traditionally has traded with the developed non-Communist countries primarily to raise the level of industrial technology and to achieve production goals more rapidly than Communist resources permit. Soviet foreign policy toward the less-developed countries is an attempt to increase Soviet influence in these countries at the expense of the West. These efforts have taken the form of both trade and aid—economic, military, and technical.

Soviet foreign trade is conducted as a state monopoly by specialized foreign trade corporations. The Ministry of Foreign Trade provides central planning and direction, preparing the foreign trade plan with the participation of *Gosplan*, adjusting it quarterly, and exercising control over its fulfillment. The Ministry of Foreign Trade also conducts negotiations and concludes commercial treaties and agreements with foreign countries, directs the activities of subordinate foreign trade associations which supervise day-to-day trade in particular commodities or with particular geographic areas, and formulates and carries out Soviet customs policy. Also in the area of international economic relations, the State Committee for Foreign Economic Relations (GKES) is charged with the establishment and development of economic contacts with all foreign countries. It supervises technical collaboration, aids in the construction of projects abroad, and oversees the training of specialists and the granting of credits.

c. GEOGRAPHIC DISTRIBUTION OF FOREIGN TRADE—During the 1960's the share of Soviet foreign trade accounted for by Communist countries fell from three-fourths to two-thirds. Conversely, trade with the non-Communist world increased, largely because of the rapid growth in trade with the developed countries of the West (Figure 134). The decline in trade with Communist China—from 15% of total Soviet foreign trade in 1960 to 0.5% in 1969—was also an important factor in the reduced share of the Communist countries. Communist Eastern Europe's share has not changed significantly over the decade, but such countries as Cuba and Yugoslavia have become more important in Soviet trade. The value of exports and imports as well as the foreign trade balance is shown in Figure 135.

d. COMMODITY COMPOSITION OF FOREIGN TRADE—The commodity composition of Soviet foreign trade has



*Includes Cuba, Mongolia, North Korea, North Vietnam, and Yugoslavia.
 **Includes Hong Kong. Almost all of the figure for exports is a residual believed to represent Soviet military aid deliveries to less developed countries.

FIGURE 134. Main groups of trading partners, 1968

shown basically few changes in either imports or exports (Figure 136). Soviet imports since 1960 have featured machinery and equipment as well as consumer goods. Imports of machinery and equipment—almost three-fourths of which originate in Communist Eastern Europe and most of the remainder in the Industrial West—increased from US\$1.7 billion in 1960 to almost \$3.5 billion in 1968. Imports of consumer goods, valued at \$3 billion in 1968, have grown little in recent years because of a decline in food imports, particularly wheat in 1967-68. Manufactured consumer goods have figured more importantly in Soviet imports in the last few years, rising from \$1.1 billion in 1965 to more than \$1.8 billion in 1968. Most of these products originate in Communist Eastern Europe.

Soviet exports have been dominated by fuels, raw materials, and semifinished materials throughout the 1960's. Exports of machinery and equipment, however, have increased significantly—from \$1.1 billion in 1960 to \$2.3 billion in 1968. Most Soviet exports of machinery and equipment have gone to Communist Eastern Europe, and virtually all of the remainder have gone to

other Communist countries and to the less-developed non-Communist countries. Oil exports doubled in the period 1960-68, but they occupied only a slightly greater share in 1968, when they were valued at \$1.3 billion, than in 1960. The growth in exports of oil during 1965-68 resulted largely from substantially increased exports to the Industrial West. Food exports have regained much of their former importance after grain exports fell sharply in 1964-66, and in 1968 the U.S.S.R. was a net exporter of grain.

e. EXCHANGE RATE AND INTERNATIONAL PAYMENTS POSITION—Soviet currency is not convertible and the fixing of rates of exchange vis-a-vis foreign currencies has served only as an accounting device for registering foreign trade and other international payments. Prices used in trade with non-Communist countries generally correspond to those in the world market, and prices used in trade with other Communist countries must also be negotiated on the basis of world market prices.

The Soviet hard currency balance of payments has suffered substantial annual deficits. Although the U.S.S.R. generally has had an export surplus in its trade with the non-Communist countries, exports to less-developed countries usually do not generate a return in convertible currency. In addition, the U.S.S.R. has failed to generate sufficient hard currency exports to the developed Western countries to offset the stepped-up imports of equipment and technology. To meet these hard currency deficits, the Soviet Union sold gold and obtained medium- and long-term credits²⁰ from the Industrial West as follows (in millions of U.S. dollars):

YEAR	HARD CURRENCY DEFICIT	DEFICIT FINANCED THROUGH:	
		Sales of gold*	Net medium- and long-term credits*
1960	335	150	85
1961	300	310	90
1962	325	240	65
1963	375	525	-5
1964	575	520	10
1965	250	490	20
1966	300	45	100
1967	-100**	10	115
1968	100	10	180

*Rounded to nearest \$5 million.

**Surplus.

The Soviet response to its threatened financial position in the mid-1960's (a period of large wheat imports) was to reduce its imports of industrial goods from the West while expanding its exports. The decline in wheat imports in 1967, in addition to newly secured long-term credits from Western suppliers, led to the U.S.S.R.'s first hard currency surplus in about a decade. Although another hard currency deficit occurred in 1968, it was relatively small and was financed without significant sales of gold. As a result, Soviet gold reserves rose to about US\$1.4 billion by the end of 1968, and to an estimated \$1.6 billion at the end of 1969.

²⁰Deficits are also financed through short-term credits, i.e., those for a period of less than 6 months. These cannot be estimated with accuracy.

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FIGURE 135. VALUE OF FOREIGN TRADE, BY GEOGRAPHIC AREA
(Millions of U.S. dollars)

	1955	1960	1965	1968
Exports.....	3,427	5,564	8,175	10,634
Communist countries.....	2,726	4,211	5,556	7,134
Eastern European Communist countries.....	1,777	3,074	4,553	5,636
Communist China.....	748	817	192	59
Other Communist countries*.....	201	320	812	1,439
Non-Communist countries.....	700	1,352	2,618	3,500
Developed countries.....	554	983	1,438	2,051
Less-developed countries**.....	96	338	911	946
Other***.....	51	31	270	502
Imports.....	3,060	5,628	8,058	9,410
Communist countries.....	2,418	3,978	5,610	6,367
Eastern European Communist countries.....	1,657	2,795	4,673	5,644
Communist China.....	644	848	226	37
Other Communist countries*.....	117	335	712	687
Non-Communist countries.....	642	1,650	2,448	3,043
Developed countries.....	441	1,080	1,601	2,144
Less-developed countries**.....	199	564	845	884
Other***.....	3	6	2	15
Trade Balance†.....	367	-64	117	1,224
Communist countries.....	308	233	-54	767
Eastern European Communist countries.....	120	279	-120	-8
Communist China.....	104	-31	-34	22
Other Communist countries*.....	84	-15	100	752
Non-Communist countries.....	58	-298	170	457
Developed countries.....	113	-97	-163	-93
Less-developed countries**.....	-103	-226	66	62
Other***.....	48	25	268	487

NOTE—Figures may not reflect exact differences or totals because of rounding.

*Albania, Mongolia, North Korea, North Vietnam, and Yugoslavia; also includes Cuba from 1960 on.

**Includes Cuba for 1955.

***Includes Hong Kong. Most of the exports are believed to represent military exports to non-Communist less developed countries.

†A minus sign indicates net imports.

The increased requirements for convertible currency since the late 1950's, caused by the rapid growth of East-West trade, has prompted the expansion of Soviet banking activities and institutions in the West. Soviet-owned banks in the West have developed into diversified banking institutions and by 1968 had assets in excess of US\$1.6 billion. These facilities have given the U.S.S.R. the ability to gather commercial intelligence, to use outside sources of funds, to maintain a degree of secrecy in its financial transactions, and to participate in foreign exchange and Euro-currency markets.

f. SOVIET FOREIGN AID—Since World War II the U.S.S.R. has undertaken an impressive program of economic assistance to both Communist and non-Communist less developed countries. A total of US\$18.7 billion of economic assistance has been extended, of which \$11.8 billion was provided to Communist countries.

Aside from large credits provided to East Germany in 1961 and development aid extended to Bulgaria, the U.S.S.R.'s aid to the countries of Communist Eastern Europe has been minimal since 1959. By far the largest share of Soviet aid during the 1960's has been directed to Cuba, Mongolia, and North Vietnam, in that order.

Approximately 85% of the Soviet aid extended to Communist countries has been drawn, while almost one-half of the remainder is scheduled to be drawn by Bulgaria and Mongolia during 1970-75. Communist countries have drawn a larger percentage of the aid extended than have the non-Communist less developed countries. This is largely because of the special bilateral economic and political relationships between the U.S.S.R. and the other Communist countries; the U.S.S.R. is the single most important trading partner of these countries. In addition, due to the close cooperation between *Gosplan* and its counterparts in the other Communist countries, the Soviet aid commitments are embodied not only in the national economic plans of these countries but also in their long-term and annual trade agreements with the U.S.S.R. This special relationship does not exist between the U.S.S.R. and the non-Communist less developed countries. Moreover, the implementation of aid has been more rapid in the Communist countries, especially in Communist Eastern Europe, because of the higher level of native skills that exists there compared with the developing non-Communist countries.

Soviet economic aid to non-Communist less developed countries has been extended mostly for

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FIGURE 136. COMMODITY COMPOSITION OF
TRADE
(Percentages of total)

	1955	1960	1965	1968
Imports*	100.0	100.0	100.0	100.0
Machinery and equipment.....	30.2	29.8	33.4	36.9
Fuels, lubricants, and related materials.....	8.2	4.2	2.5	1.9
Ores and concentrates.....	8.2	5.6	3.9	2.0
Base metals and manufactures..	6.7	9.7	4.9	4.8
Chemicals.....	1.7	2.7	4.7	5.7
Rubber and rubber products....	1.4	3.5	2.5	1.8
Wood and wood products.....	3.0	1.9	1.9	2.1
Textile raw materials and semi-manufactures.....	5.4	6.5	4.4	3.9
Consumer goods.....	21.8	27.9	33.0	31.9
Other.....	13.4	8.4	9.0	8.9
Exports*	100.0	100.0	100.0	100.0
Machinery and equipment.....	17.5	20.5	20.0	21.6
Fuels, lubricants, and related materials.....	9.6	16.2	17.0	15.8
Ores and concentrates.....	3.4	4.4	3.8	3.3
Base metals and manufactures..	12.6	15.1	16.3	13.6
Chemicals.....	2.1	2.7	3.0	3.5
Wood and wood products.....	5.1	5.5	7.3	6.4
Textile raw materials and semi-manufactures.....	10.1	6.4	5.1	4.5
Consumer goods.....	15.7	16.2	11.1	12.5
Other.....	23.9	13.1	16.5	18.8

*Figures may not add to totals because of rounding.

assistance to public sector heavy industrial projects under credits that are repayable in 12 annual installments, at 2.5% interest. Since 1965 the U.S.S.R. has extended an increasingly larger share of its aid in the form of medium-term credits which not only carry shorter repayment periods and higher interest rates but sometimes require substantial downpayments. These credits usually finance the purchase of machinery and equipment, rather than the purchase of complete plants, and often may be taken up by the private sector of the developing countries' economies.

The annual aid extended by the U.S.S.R. to non-Communist less developed countries has varied widely, from a low of US\$76 million in 1962 to record extensions

of \$1.3 billion in 1966. Nevertheless, recent fluctuations in annual aid undertakings do not appear to be related to changes in post-Khrushchev policy. The fluctuations that have occurred are to be expected in a program with major commitments to projects and development plans that often require several years for implementation. For the most part, recent peak years have reflected the extension of aid to countries that are initiating new development plans; the low years often mean that major aid recipients are working off credits previously extended. Actual drawings of the aid extended to non-Communist less developed countries total \$3 billion. Deliveries to these countries, which are the most reliable indicator of the scale of foreign aid in any given year, rose to \$377 million in 1964 and then leveled off in subsequent years, falling to \$287 million in 1969. On the other hand, a rapid rise in repayments, in the face of declining deliveries, has resulted in a reduction of the net flow of Soviet aid to the developing countries. In 1969, developing countries were scheduled to repay the U.S.S.R. an estimated \$180 million in principal and interest for deliveries of economic aid against credits, resulting in a net inflow of aid into the developing countries of little more than \$100 million during the year.

Compared with Western aid, the amount of Soviet aid is small, but, because of Soviet propaganda, the timing of new aid commitments, and the kinds of projects undertaken, the political impact sometimes has overshadowed the volume of aid or its ultimate economic effect. Nevertheless, the U.S.S.R. has recently adopted a longer view of the effectiveness of its aid program and increasingly has applied greater selectivity in its aid determinations. It is earmarking most of its new aid for a few countries in the Middle East and South Asia. Of total Soviet assistance extended to the less developed countries during 1965-69, more than 80% was allocated to the Middle East and South Asia, compared with about 60% in 1960-64. Meanwhile, Africa's share of the total fell from 28% to 11%, and the combined share of East Asia and Latin America fell to about 7%.

7. Scientific

A. General

Soviet leaders from the time of Lenin have emphasized the importance of science and technology to industrial progress and as a means of achieving national political, military, and economic objectives. They have encouraged the improvement and advancement of both basic and applied research and the expansion of scientific institutions and support facilities. The rapid growth in scientific and engineering manpower and facilities, particularly since 1965, is evidence of the large investment the Soviet regime is making in many branches of science. The U.S.S.R. has applied its growing scientific and technological capability to the solution of problems of national importance. Priority is given to the development of new weapons systems and the improvement of existing weapons and systems, as well as to the space program which has greatly enhanced Soviet international prestige.

Soviet science, despite its tremendous progress, remains second to that of the United States in most critical areas, and in one or two additional fields Soviet technology lags that of the leading Western countries. Nevertheless, the U.S.S.R. has been able to make some spectacular advances in military and space technology through concentration of its efforts and resources in these particular areas, and the strong and growing scientific-technical capability provides the country with a capacity for rapid progress in many areas.

Soviet control over science and technology is maintained by coordinated planning and direction to insure maximum utilization of resources for the development of a strong scientific and technological base. In spite of these control efforts, the Soviet leaders have been dissatisfied with the ability of science to provide a basis for a stronger and more versatile industry. A 1968 joint Communist Party-government resolution, aimed at increasing the utility of science to industry, introduced the concepts of profitability and financial incentives to motivate institutes to increase the applicability of their research to production. There is some resistance on the part of Soviet scientists to the efforts to redirect their research, and the long-term results of the party-government moves are uncertain. It seems probable, however, that more emphasis will be placed on applied and less on basic research.

Improved relationships between scientific theory, experimentation, and application have been, in large measure, the objectives of several reorganizations since

1957 in the administration of Soviet science^{25X1f} reforms in the educational system. A related program, still underway, is the geographic dispersal of scientific facilities and activities.

The Soviets often have employed intelligence means and subterfuge to obtain technical information and designs to assist in overcoming important research and development problems. Numerous Soviet developments are based on original Western work, and in many technical fields progress has been accelerated by large and aggressive scientific and technical intelligence programs and the ability to circumvent Western legal restrictions on certain exports. In addition, the U.S.S.R. has openly drawn on and exploited the scientific and technical resources of the Eastern European countries, along with those of other countries.

Science has become an important tool of Soviet political strategy. As a result of its achievements in space and other aspects of technology, the U.S.S.R. has gained in scientific prestige. It has exploited this prestige in the East-West power struggle by carefully cultivating the image of the Soviet system as that best suited for achieving social and economic advancement and military strength. This image is projected through propaganda, trade fairs, exhibitions, and technical aid to less developed countries.

In recent years Soviet leaders have increased participation in international scientific affairs, including exchanges, meetings, and projects, and have become more active in the leadership of international scientific organizations. However, Soviet leaders are still fearful of allowing scientists to travel abroad and from time to time take restrictive actions that discourage Soviet scientific cooperation with the West. Among the Communist countries, in addition to exchanges, the U.S.S.R. has fostered the coordination of national research plans as well as cooperative scientific and technical programs under the auspices of the Council for Economic Mutual Assistance (CEMA). Soviet efforts to promote and participate in these international activities appears to be motivated both by the desire for international prestige and by the need to increase the flow of scientific and technical information into the U.S.S.R.

B. Organization, planning, and financing of research (S)

1. Organization

Research and development in the Soviet Union are controlled by the U.S.S.R. Council of Ministers and

administered through various ministries, state committees, and other agencies, including the academies of sciences. General policy is set by the Communist Party of the Soviet Union (CPSU) and controlled through party representation at all levels down to the individual research facility. The party concentrates on establishing general policy, expediting high-priority projects, and solving broad problems. Management of the overall effort is left to the governmental apparatus, which is organized to insure that most Soviet research and development projects directly support specific sectors of the economy (Figure 137).

The Soviet research structure has undergone a series of reorganizations since the major decentralization of 1957. Those of 1961, 1963, and 1968 resulted in a partial return to highly centralized management. Since 1968 greater emphasis has been placed on improving the efficiency of research and development and speeding its utilization in industry. The U.S.S.R. has about 5,000 scientific institutions, most of which fall under the following elements of the state administrative structure: the U.S.S.R. Academy of Sciences and the 14 union republic academies of sciences, which together are sometimes referred to as the academy system; the Ministries of Defense, Agriculture, Health, and Higher and Secondary Specialized Education; various

industrial ministries and state committees; the U.S.S.R. State Committee for Science and Technology (GKNT); the U.S.S.R. State Planning Committee (*Gosplan*); and various administrations and main administrations.

The U.S.S.R. Academy of Sciences is the leading scientific institution in the Soviet Union, and many of the most important scientists and research facilities in the country operate under it. The academy has the prime responsibility for basic and theoretical research. In addition, it advises the government on such other matters as the exploitation of resources and on various aspects of economic planning. It provides postgraduate training for some of the country's best students, as well as other training designed to increase the capabilities of scientific workers. The academy has four sections—Physical-Technical Sciences; Chemical-Technological and Biological Sciences; Earth Sciences; and Social Sciences—with 16 subordinate departments (Figure 138). Each department acts as a national coordinating center responsible for guiding research in its specialized fields in institutes of the academy and in other institutes throughout the country working in the same fields. In addition to these 16 departments, there is a 17th department, the Siberian Department, organized on a regional rather than a substantive basis and not under one of the four substantive sections; it is responsible for scientific and technical activities designed to benefit

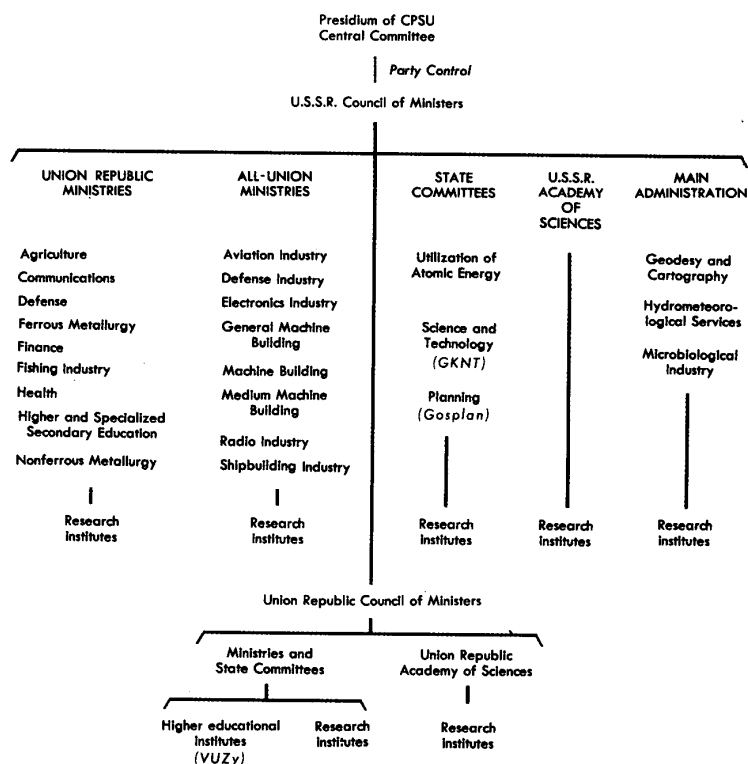


FIGURE 137. Organization of Soviet science and technology, 1970 (C)

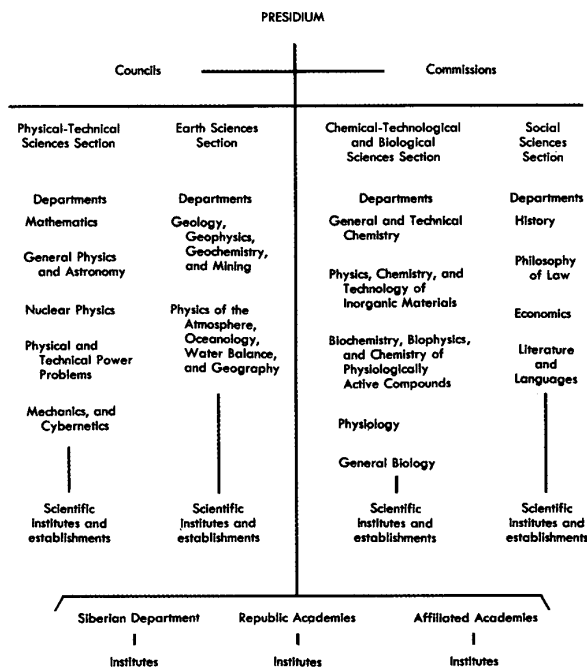


FIGURE 138. Organization of the U.S.S.R. Academy of Sciences, 1970

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Siberia and the Soviet Far East, especially those furthering economic development.

Most of the research of the academy is carried out in over 200 institutes, the majority of which are administered by the 17 departments. The presidium of the academy administers some directly. The academy also has 10 affiliates which are separate institutes or groups of institutes—little “academies of science”—often in remote areas. Four of the affiliates are under the Siberian Department and the other six are administered by the presidium of the academy. The primary function of the affiliates is to study the natural resources of the regions in which they are located and to aid in industrial development.

There are also academies of sciences in 14 of the 15 union republics (the Russian Soviet Federated Socialist Republic does not have a republic academy). The U.S.S.R. Academy of Sciences has considerable authority over the planning and financing of research by these academies, primarily to avoid duplication of effort. The republic academies do research in depth, usually on problems of particular concern to their own union republics.

Applied research and engineering development are carried out generally in facilities subordinate to the appropriate all-union ministries, state committees, and councils of national economy, or to similar agencies of the union republics. Military research and development are performed predominantly by facilities of defense-

related industrial ministries, including the All-Union Ministries of Defense Industry, Aviation Industry, Shipbuilding, Radio Industry, Electronics Industry, Medium Machine Building, General Machine Building, and Machine Building. These ministries control a number of research institutes, design bureaus, testing facilities, proving grounds, and experimental production plants designed to meet the needs for new and improved weapons, support equipment, and supplies. In addition to military systems testing and acceptance by the Ministry of Defense, some theoretical and applied research and development are conducted by a limited number of highly specialized research institutes and by specialized military training academies. The Ministry of Defense also contracts for research and development conducted in nondefense organizations, such as the academies of sciences and certain industrial ministries, exercising control through resident representatives.

Agricultural and medical research fall within the jurisdiction of the U.S.S.R. Ministry of Agriculture and the U.S.S.R. Ministry of Health, respectively. Each ministry controls research institutions either directly or through corresponding ministries at the union republic level. The more important research institutes of these two ministries comprise specialized academies: the All-Union Academy of Agricultural Sciences *imeni V. I. Lenin* and the Academy of Medical Sciences.

The U.S.S.R. Ministry of Higher and Secondary Specialized Education supervises research at higher

educational institutions (VUZy), although many institutions themselves are administratively subordinate to various agencies at the union republic level. Fundamental and theoretical research at the VUZy, as at other organizations, is guided by the U.S.S.R. Academy of Sciences. Much of the applied research is done on a contractual basis for industrial organizations and is guided by them. Although the quality of research is high at some VUZy, all VUZy together play a far lesser role in the total Soviet research effort than do higher educational institutions in Western countries and a lesser role than might be expected from the number of scientists on the faculties. One reason is that the existing system of Soviet academies of sciences has assumed leadership in research areas that in other countries is held by universities. The regime's efforts since the early 1950's to make better use of the VUZy research potential have met with only limited success. The efforts have been intensified in recent years, however, and some progress is being made.

2. Planning

Soviet scientific and technical plans are an integral part of national economic and military planning and are developed by the U.S.S.R. State Planning Committee (*Gosplan*) based on policies laid down by the CPSU Central Committee and on directives of the U.S.S.R. Council of Ministers. Research and development plans span 5-year periods and are based in part on 15- to 20-year projections of future technical developments and needs. Although the research and development plan for 1966-70 is coming to a close, the plan for 1971-75 had not been released by July 1970. The *Gosplan* is assisted on scientific and technical matters by the State Committee for Science and Technology (GKNT), which has overall responsibility for scientific and technical planning, specifically for applied research and development. The GKNT is an all-union organization charged with maintaining a unified national scientific and technical policy and insuring that research results are utilized effectively. Pursuant to directives from the party and the government, it coordinates scientific and technical activities, especially in priority areas; plans capital investments for science; approves organizational changes including the creation of new research facilities; manages the dissemination of scientific and technical information; and monitors the funds budgeted for science. It also can require ministries and other organizations to submit general and specific plans for using science funds.

The GKNT is composed of 10 directorates: Power and Electrical Technology, Mineral Resources, Metallurgy, Machine Building, Instruments and Radio Electronics, Computer Technology and Control Systems, Lumber and Construction Materials, Light Industries, Food Industries, and Transportation. In addition, it has several departments, including ones for the organization of science, general planning and development, finance, and foreign affairs. Its information unit, now

called the All-Union Scientific-Technical Information Center, provides information storage and retrieval, and drafts statutes on the technical-economic justification of applied research, on intrainstitute cost accounting, and on the rights, duties, and responsibilities of scientific organizations.

The U.S.S.R. Academy of Sciences is responsible for coordinating and approving national research plans for the natural and social sciences. Similarly, the Academy of Medical Sciences is responsible for medical science planning and the All-Union Academy of Agricultural Sciences for agricultural science planning.

Soviet research and development priorities are based on key problems of national importance, selected on the basis of recommendations of scientific councils and approved by the GKNT. The scientific councils are composed of outstanding specialists who are designated by the GKNT or the responsible academy and who are selected from research and development organizations, VUZy, and industry. The councils are assisted by head institutes, which also provide staffs for the councils. A head institute is officially designated by the GKNT or the responsible academy as the outstanding national research facility in a field, based on the quality of personnel and equipment, and is expected to provide leadership to other facilities having the same or related interests. The GKNT also has established advisory councils in each research facility to review programs continuously and to evaluate progress independent of management. These advisory councils are intended to provide a mechanism that gradually will serve to improve planning, because the projects proposed by individual institutes are the basic input to the national plans and provide continuity to the complex and frequently changing Soviet planning process.

3. Financing

For many years the Soviet Union has attempted, without much success, to improve the practical utilization of research and development. Research results often are not used by industry for many years and frequently are never used. The latest attempt began in 1968 with a joint resolution of the CPSU and U.S.S.R. Council of Ministers for improving the efficiency of research and for speeding the utilization of research findings. The resolution has evolved into a major program to extend the principles of the current economic reform in industry—profitability and financial incentives—to the scientific sector, including the academy and institutes under VUZy. Even fundamental and theoretical research must be justified in some way to warrant funding. Wages and bonuses for individuals engaged in research and development and the profits of individual institutions are determined, in part, by the economic effectiveness of their work. This is the first Soviet attempt to apply economic standards and measurement criteria to scientific and technical activities and has caused some delays and confusion. The resulting reorganizations and changes in work rules

also have caused much dissatisfaction and maneuvering for advantages. Although both the party and government are pushing the program, bureaucratic inertia and opposition may limit the long-term benefits.

The joint resolution named the GKNT as the executive agent to prepare and submit for approval the regulations needed to implement the policies outlined. The activities of academy and VUZy research establishments were placed under periodic review using the same criteria of effectiveness as for industrial research organizations. Changes in research emphasis undoubtedly are resulting from this program and may lead to a reduced emphasis on basic research.

Much Soviet research and development is financed directly by the government as budget allocations for specific research institutions, or indirectly through the budgets of individual ministries and state committees of the U.S.S.R. Council of Ministers or of the union republic councils of ministers. Some research is financed by individual organizations from funds accumulated from various sources, but since the initiation of the reform movement a substantial portion of research in academy and VUZy institutes, as well as elsewhere, is funded through contracts with industrial enterprises. The GKNT controls the state science budget, although some 30% of the funds provided to the U.S.S.R. Academy of Sciences may be unallocated and held for use by the president of the academy at his discretion. In 1965 the academy reportedly expended about 3.5% of the total Soviet state budget for "science." By 1970 the total budget had grown to 12.2 billion rubles. If these figures reflect the current situation, the academy's discretionary fund makes about 300 million rubles available for promising projects that are unplanned or unfundable in some other way.

Soviet monetary allocations for "research establishments" reflect rapid growth but not the magnitude of the overall effort. Furthermore, these allocations may not include expenditures on military projects, such as nuclear weapon developments, that are not specifically identified publicly as expenditures for science. The total funding for all civilian and military research and development (including space) rose from about 3.9 billion rubles in 1960 to almost 12.2 billion rubles by 1970. Most of the increase occurred in the military research and development and space programs, where expenditures rose from 2.5 billion rubles in 1960 to almost 8.0 billion rubles in 1970. In 1960 expenditures for military research and development and space programs accounted for about 16% of the total Soviet military expenditures and in 1970 for about 35%. Rates of growth have remained fairly high in comparison with other Soviet defense expenditures.

C. Scientific education, manpower, and facilities (S)

The U.S.S.R. has about 800 higher educational institutions (VUZy), including 49 universities, about 400 engineering and technical institutes, and some 200

pedagogical institutes offering science courses for those studying to be teachers. Total VUZy enrollment is about 4,500,000. The engineering and technical institutes generally concentrate on a specific applied field, such as metallurgy or agronomy, whereas the universities are concerned primarily with the basic sciences, such as physics, biology, or mathematics. Although the specialized institutes do a good job of preparing students for a particular field of work, their graduates tend to lack general competence in broad areas. The quality of Soviet higher education varies considerably among the VUZy and according to the specialty studied. Quality is generally best in VUZy in the larger cities, such as Moscow, Leningrad, Khar'kov, and Kiev; an exception is the university at Novosibirsk, which is outstanding despite its provincial location.

Both scientific and educational authorities are seeking to improve the selection process for scientific and engineering students, and several experiments are underway. Students continue to be selected by competitive entrance examinations with successful applicants assigned to a specific department of a VUZ under a quota system. Unsuccessful applicants can obtain a higher education by attending evening and correspondence schools; about half of all college-level enrollment is by part-time students.

Postgraduate training, available only to outstanding students, is provided at designated VUZy and research facilities of the academies, ministries, and other agencies. Physics and mathematics students go directly into graduate school so that they can begin research during their most creative years; others must complete 2 years of teaching or industrial work before admission. The most important postgraduate degree is "*kandidat* of sciences" (roughly equivalent in most science and engineering fields to the U.S. doctoral degree). Graduates can also obtain this degree without formal training by passing the "*kandidat* minimum" examinations and preparing and defending a dissertation containing original scientific work. The highest degree, *doktor* of sciences, is awarded for outstanding original scientific work and frequently also as an honor for achievements over a period of years.

Soviet leaders have trained the largest scientific and engineering manpower force in the world; however, the average quality of Soviet engineers appears not to have kept pace with that of leading Western countries, and in many cases utilization of engineers continues to be inefficient. The best Soviet scientists do research on a par with that of leading Westerners, and their average quality is good. The U.S.S.R. has about 2.1 million engineers who have completed higher education and about 300,000 scientists.²¹ Engineers constitute about

²¹The Soviets report a much larger number of "scientific workers" but include in the total such professionals as research and academic engineers, called technical scientists, who are counted as engineers in this survey. The Soviets also include as "scientific workers" a number of professionals in other fields, such as the sociological disciplines, not included in the total of 300,000 which represents an estimate of the number of physical, chemical, biological, mathematical, medical, pharmaceutical, agricultural, veterinary, geological, mineralogical, and geographical scientists.

0.9% of the total Soviet population, and scientists about 0.1%. About 21% of Soviet engineers are working in research, development, or educational institutions. The number of advanced scientific and technical degree holders (*kandidat* or higher) is currently about 160,000 and is growing rapidly but not as rapidly as the total number of personnel engaged in research and development and in the education of scientists.

Political and social controls and pressures and difficult working conditions that would seem unsatisfactory to Westerners are usually accepted by Soviet scientists and engineers. Morale is generally high, especially among physical scientists and engineers, although young scientists and engineers find the great emphasis on seniority frustrating, because it gives them little chance to advance to leading positions before the age of 40, if ever. The expansion of facilities into outlying areas probably is providing well-trained young professionals with opportunities for leadership; but provincial, especially Siberian, assignments are not popular and often are declined when possible.

Scientific and technical pay scales are graduated according to academic achievement, experience, and the responsibility of the position held and are accompanied by extensive fringe benefits that permit a style of living far above that of the average Soviet citizen. An extensive use of prizes and other honors adds further to the prestige of scientists and engineers and is intended to stimulate originality and encourage research and development, especially that most likely to be of immediate practical value to the country.

The U.S.S.R. continues to increase and expand its research and development facilities at a rapid pace but has not been able to keep up with the needs for space and equipment. Most facilities are located either in the Moscow-Leningrad area, the Ukraine-Black Sea region, or western Siberia; the concentration is especially high in the Moscow area. As a result, a program was begun about 1957 to create some 75 new "science cities" throughout the U.S.S.R. As of 1970 the Novosibirsk and Irkutsk centers have made the most progress among the new "cities"; some of the older science centers, such as that at Krasnaya Pakhra, have also been expanded considerably. Little is reported about the others, but the program is continuing. These centers are being used to test various solutions to scientific and technical administrative problems. For example, in an effort to promote the interchange of ideas among scientists, engineers, and industrial production personnel, a few experimental factories and design bureaus have been set up near the Novosibirsk science city under joint academy-ministry administrative control to help expedite the conversion of research findings into practical industrial applications.

D. Major research fields

1. Air, ground, and naval weapons (S)

a. AEROSPACE SYSTEMS—The U.S.S.R. has developed a wide variety of manned military aircraft, including interceptor, tactical, support, and bomber systems. At

present, the Soviets have at least five new fighter aircraft and one strategic bomber under advanced development, illustrating their continued emphasis on the development of interceptor-tactical fighter aircraft. Research on variable geometry (or swing-wing) aircraft, vertical-takeoff-and-landing (VTOL) and short-takeoff-and-landing (STOL) aircraft has been noteworthy and is furnishing the Soviets with a number of options available for future deployment. Soviet aircraft researchers have gained considerable experimental information on currently advanced concepts while continuing design activity, thus achieving an advantageous position to apply development knowledge to future systems. Soviet technology is aimed at providing a wide variety of new systems, as well as ones of higher performance. The most advanced civil aircraft known to be under development is the Tu-144, a Mach-2 supersonic transport (SST).

The applied research underway in such areas as airframe design, structures, propulsion, materials, and manufacturing processes covers the low subsonic to the hypersonic regimes of flight. The results of the airbreathing engine research continues to improve engine performance, dependability, and life expectancy. Adequate test facilities are available to verify experimentally and to refine conceptual designs from relatively simple aircraft to hypersonic steady-state, maneuverable, and lifting-reentry spacecraft.

Activities in weapons materials developments have continued at an increasing rate. The Soviets have developed such items as a new titanium alloy for compressor sections of high-performance aircraft engines and for cryogenic applications, a new steel series of at least eight high-strength steels, sintered aluminum materials for skins of supersonic aircraft, and fiber-reinforced plastic and metal composites. No breakthrough in superalloys or coatings for refractory metal alloys have been identified, and increases in turbine engine performance have been dependent upon development of novel turbine cooling schemes.

Research in aerodynamics is underway in all flight regimes. The Central Aero-Hydrodynamics Institute (TsAGI) in Moscow remains the principal organization for conducting classified applied research. A renewed interest in subsonic aerodynamics has been brought about by recent special emphasis on V/STOL and ground effect machines (GEM). The Institute for Theoretical and Applied Mechanics in Novosibirsk, working with industry and research institutes, is engaged in an effort to establish laminar flow technology for aircraft range extension. A broad program of applied structural mechanics research is distributed widely within the research facilities of the Ministries of Aviation Industry, of Defense, and of Higher and Secondary Specialized Education. The Soviets have emphasized the utilization of multispar, thick-skinned wings in contrast to the heavy-spar, thin-skin wings employed during the 1960's.

No plateau can be identified in Soviet propulsion technology. Advancements in liquid rockets have

resulted from improvement of the engine cycles and components rather than introduction of new propellant combinations. Extensive research is underway on additives to improve burn rates and the release of greater energy. This work is characteristic of large solid-motor development.

Missile research and development has been broad in scope, resulting in numerous offensive and defensive systems to meet both strategic and tactical requirements. The Soviets have a large and intensive research and development program on a full range of missiles from the short-range tactical types to the intercontinental ballistic missiles (ICBM's). The Soviets have had a large successful program for liquid-propellant ICBM's; six systems have been developed, some of which have evolved in several variants. More recent research efforts have focused on the development of greater sophisticated payloads for the proven launch vehicles, designed to improve penetration capability and to increase effectiveness with specialized targeting.

Developments cover a rather complete range of offensive missile weaponry and include:

- 1) The SS-12, a single-stage, liquid-propellant, mobile, strategic, short-range ballistic missile (SRBM) system (operational).
- 2) The SS-9 Mod 3 (formerly SS-X-6), using a de-boosted reentry of the payload (operational).
- 3) The SS-14, a two-stage, solid-propellant, mobile, medium-range ballistic (MRBM) system (may be deployed in limited numbers).
- 4) The SS-9 Mod 4 ICBM, a system which apparently is intended to deliver three warheads to individual targets, suggesting a multiple independently targeted reentry vehicle (MIRV) capability (not operational in early 1971).
- 5) Two new reentry systems (one with reentry vehicle and two decoys and one with three probable reentry vehicles) for the SS-11 ICBM, in conjunction with launch vehicle modifications (not operational in early 1971).
- 6) A modification of the three-stage, solid-propellant SS-13 ICBM, which includes a new reentry vehicle (not operational in early 1971).
- 7) A new long-range (about 3,000 nautical miles) liquid-propellant naval ballistic missile probably intended for submarine launch, designated the SS-NX-8 (not operational in early 1971).

Research on defensive missiles also is broad in scope. There has been a steady evolution of Soviet surface-to-air missile (SAM) system design, including strategic, tactical, and naval types of missiles. Since 1955 the Soviets have had a major effort underway to develop an antiballistic missile (ABM) system. The ABM-1 system is being deployed around Moscow.

The U.S.S.R. has a well-planned, comprehensive, and expanding space research program that aside from probing the unknowns of space is actively pursuing certain military objectives. For instance, the Soviets appear to have been testing components of a co-orbital antisatellite (ASAT) system. In the support area the Soviets have operational communications, photographic and electromagnetic reconnaissance, navigation, and meteorological satellites. The U.S.S.R. has launched over 500 space payloads.

Soviet space activities continued at a record level during 1969 and 1970. During 1969 there were a total of 80 launch attempts, and achievements included the impact of two interplanetary capsules on the planet Venus; the rendezvous and docking of two *Soyuz*-type spacecraft, evidence of Soviet interest in space stations; the flight of an unmanned circumlunar probe; and the launching of 11 cosmonauts into space—seven of them in three simultaneously orbited *Soyuz* vehicles. As of 26 October 1970 the Soviets had made 65 launch attempts that included the launching in September of the *Luna-16*, which landed on the moon and returned with samples of the lunar surface; the endurance record of 18 days in orbit with two men of the *Soyuz-9*, launched in June; and the 20 October launch of the *Zond-8*, which circled the moon and returned to earth. Military space support programs have continued with the launchings of special-purpose satellites. Despite their achievements, the Soviets have experienced setbacks with the SL-12 launch system. This system is the Soviet Union's largest booster known to be in use and was developed to become the workhorse launcher for lunar and interplanetary missions.

b. GROUND WEAPONS AND EQUIPMENT—Ground weapons and equipment development programs reflect a high degree of technical capability. In the armored vehicle category, the greatest emphasis has been placed on the development of a medium tank. The latest Soviet development in ammunition is the 115-mm., armor-piercing, discarding sabot (APDS) projectile which can be fired at a muzzle velocity of 1,615 meters per second (m/s). As a result of continuing Soviet efforts to improve this ammunition, the velocity is expected to be increased to 1,735 m/s. Emphasis is devoted to new and improved free-flight rockets, tank armament, antitank weapons, and their associated warheads or ammunition. Work has been accomplished on self-propelled assault guns for use in air assault operations.

Research and development on armored personnel carriers have been directed toward providing a greater number of these vehicles with a larger main armament. A new category of vehicle—the infantry combat vehicle—has been developed. These vehicles, designated BMP, can operate in proximity to main battle tanks, and their main armament is capable of engaging and destroying armored vehicles if required.

Considerable progress has been made in developing a wide range of military transport vehicles, particularly heavy-duty vehicles capable of hauling tank transporters and heavy weapons. A variety of extended chassis vehicles for mounting large tactical missiles also have been produced to give these weapons mobility and quick-reaction capabilities. Extensive and competent research has been conducted on tracked and wheeled vehicles for oversnow movement and on the starting of engines under extreme cold-weather conditions. Research is continuing on air-transportable and air-droppable vehicles.

The results of research and development of engineer equipment have been impressive, particularly in

tactical bridging, in which the U.S.S.R. significantly leads the West. One notable development is the Soviet-introduced "ribbon bridge" concept (a ribbon bridge is a type of floating bridge with no open water spaces between pontoons); assembly speed of 20 linear feet of bridge per minute can be achieved. Vehicle-launched light and heavy mechanized treadway bridges can be erected in minutes instead of hours. In 1968 the Soviets developed a new tank-launched assault bridge with an overall span of 68 feet and a carrying capacity of 60 tons. For rear area bridging, the U.S.S.R. developed a floating railway bridge that can carry both rail and vehicular traffic simultaneously; no country in the West has such a bridge for military use.

Military research has taken place on all types of topographic equipment for general support and specific missile systems applications. The Soviets have a broad program in most aspects of quartermaster equipment and rations. A considerable research effort during recent years has provided the Soviets with a significant airdrop capability, including a wide range of personnel parachute assemblies and cargo drop equipment. Of major interest is the use of retardation rockets to reduce cargo-ground impact.

The U.S.S.R. is a pioneer in the development of rotary-wing aircraft (helicopters) and has placed great emphasis on the development of such aircraft for military use. Soviet helicopter design bureaus reflect a high degree of technical knowledge and creative capability. The Soviets have a significant lead over the West in the development of heavy-lift helicopters. The latest helicopter, the Mi-12, a lateral-rotor design, has a gross vertical takeoff weight of about 190,000 pounds and can carry 200 troops.

C. NAVAL WEAPONS—The ships, submarines, and naval aircraft produced in the U.S.S.R. during the 1960's, especially in the latter half of it, are mute testimony to the existence of a very large, well-coordinated Soviet naval research and development establishment. This establishment has demonstrated its capability to conceive and successfully develop large, complex, and uniquely Soviet weapon systems, some of which have no counterparts in any Western navy. The more spectacular achievements of the combined efforts of the Soviet naval research and development establishment and the shipbuilding industry since 1960 include:

- 1) A large force of diesel and nuclear-powered submarines armed with surface-launched, homing-type, anti-ship cruise missiles.
- 2) The *Moskva* class guided-missile helicopter carrier equipped with a hull-mounted sonar and a variable depth sonar, surface-to-air missiles, and antisubmarine warfare (ASW) missiles, rockets, and torpedoes.
- 3) The first large surface warship powered entirely by gas turbines—the *KASHIN* class ASW frigate.
- 4) The first large warships in the world to rely entirely on surface-to-surface cruise missiles instead of tube artillery for their main battery armament—the *KRUPNYY*, *KYND*, and *KRESTA* classes.

Soviet submarine development has produced six new types since 1968. These are the Y Class 16-ballistic missile nuclear-powered submarine; the V Class fast nuclear-powered attack submarine; the C Class guided missile nuclear-powered submarine with a possible short range surface-to-surface or subsurface-to-surface missile armament; the B Class, a highly refined diesel-powered submarine; the A Class submarine, whose propulsion is unknown; and the nuclear-powered P Class, which is probably armed with cruise missiles. All of the above nuclear-powered submarines are second-generation submarines and have significant speed and power advantages over their U.S. counterparts, although they tend to be noisier.

Continued interest is present in ground effects machines (GEM) and hydrofoils, although this work is at a lesser priority in the overall Soviet program. The Soviets continue a high level of research and development of more flexible, powerful, and economical propulsion plants as is evidenced by the use of pressure-fired boiler, combined diesel and gas turbine, and all-gas-turbine installations.

The research and development establishment supporting naval weapons developments is guided and directed by the Scientific and Technical Committee of the Navy and the Directorate of Warship Construction and Armaments of the Navy. More than 20 individual scientific research institutes and universities and over a dozen design bureaus specializing in various aspects of the naval research and development program have been identified, and many more are believed to exist. One of the most noted of these is the Central Scientific Research Institute *imeni* A. N. Krylov in Leningrad, which is the Soviet equivalent of the U.S. Naval Ship Research and Development Center (NSRDC). The Krylov Institute appears to have facilities generally similar to those of NSRDC and in addition is building a large new variable-pressure circulating water channel with a free surface. When completed, this facility will be unequaled in the West and will permit the Soviets to take a new approach to experimental research on cavitation problems related to the hydrodynamic designs of high-speed warships and very large tankers.

2. Biological, chemical, and radiological warfare (25X1)

The U.S.S.R. has the capability to produce and to deliver a variety of biological agents and to develop protective devices and other equipment to support effective biological operations. The Soviets have an active defensive biological warfare (BW) program and are devoting considerable effort to microbiological research covering many areas applicable to offensive BW. They are well advanced in methods of immunization against some potential BW agents and in the production of potential offensive BW agents; there is no evidence, however, that the Soviets are producing and stockpiling any of the known BW agents or delivery systems. The long history of serious endemic diseases in the U.S.S.R. has forced attention on epidemiological

problems, and Soviet scientists are experienced in this field.

Significant strides have been made in the various fields of microbiology. In applied immunology, vaccines against many potential BW agents have been developed or are being investigated. Microbial genetic studies include mutation investigations pertinent to offensive BW. Considerable research is expended on the control of viral diseases, especially influenza and hepatitis. Other multipurpose research is concerned with arthropod-borne encephalitides, which could provide data for the development of an insect-vector BW agent delivery system as well as for the solution of public health problems. The Soviets also are studying the properties and genetics of certain exotic viruses and are investigating selected fungi generally considered to be plant pathogens.

An outstanding achievement by the Soviets in the area of BW-related research is the development of a technique of large-scale aerogenic immunization with attenuated living agents known to be of BW significance. This research contributes to their data base on the characteristics of aerogenic infection for offensive BW. Aerosol immunization may provide maximum protection from aerosol-delivered agents. Research is underway on the development of polyvalent vaccines. Some knowledgeable observers believe that publicized Soviet successes with aerosol immunization have been exaggerated, and that the program was far from operational in 1969. Also, difficulties continue with the purity, potency, and reliability of attenuated viral and bacterial vaccines.

The U.S.S.R. has a strong offensive and defensive CW research and development capability. It has an effective CW research organization and sufficient high-quality personnel for an excellent CW research program. Chemical warfare-associated research is underway on more direct and economical methods for preparation of key intermediates in known syntheses of CW nerve agents, on compounds related to potential physically incapacitating agents, and on antidotal therapy for organophosphorous compounds. Various new organic compounds are being synthesized and tested for anticholinesterase activity, but there is no firm evidence that the purpose is the discovery of compounds possessing high anticholinesterase activity nor is there any indication of increased interest in organophosphorous compounds or carbamates. Organophosphorous research emphasizes the refinement and improvement of potential nerve agent syntheses; percutaneous studies also are stressed. Intensive research on organophosphorous compounds has given Soviet scientists a thorough knowledge of agents which affect the central nervous system. These compounds include those that are sufficiently volatile to be effective primarily through the respiratory track (G-agents) and those less volatile and more toxic through the skin (V-agents).

The high quality of Soviet work, culminating in the synthesis of a probable V-agent, VR-55, is believed to

have provided the U.S.S.R. with its agent of choice. The chemical composition of VR-55 is not known. There is evidence that the U.S.S.R. also has the G-agent soman (GD) in its stockpile; at present, the West has no antidote for GD. Both GD and reportedly VR-55 are superior in toxicity, percutaneous activity, and persistency to the stockpiled U.S. agents, sarin (GB) and VX. Synthesis-related research has included: 1) attempts to refine the aluminum chloride process for making phosphonate esters; 2) modification of the transester process to permit preparation of V-agents unobtainable by the original process; and 3) preparation of organophosphorous methylsulfomethylates (a class of compounds characterized by high toxicity which would be suitable for use in toxic fragments or flechette munitions). Also under development is a process for producing phosphorous acid azides, which behave like G-agents in that they are semipersistent and possess exceptional stability in storage.

Many theoretical concepts applicable to the synthesis of nerve agents have originated with a group of researchers headed by M. I. Kabachnik at the Institute of Hetero-organic Compounds. These concepts may continue to find application in the synthesis of nerve agents with high toxicity. The research results of the group has provided a basis for establishing structure-activity (toxicity) relationships for nerve agents.

Soviet scientists are deeply involved in natural products research and in the natural toxins of these products. Intensive interest is shown in the toxins produced by marine organisms and plants and in other naturally occurring sources of poisons. Protein synthesis and degradation receive much attention, because protein and protein fragments are among the most toxic materials known.

Incendiary research includes investigations of halogen fluorides, especially chlorine trifluoride, which have low boiling points and react vigorously with organic material on contact—a desirable characteristic to incorporate in self-igniting fuels. The trialkyl aluminums are under consideration as candidate self-igniting fuels. Work on smoke appears to be directed toward better screening smokes, including the development of mixtures which might be used for attenuating and scattering infrared radiation and defeating combat surveillance devices based on infrared radiation detection.

The U.S.S.R. has one of the most aggressive aerosol research programs in the world. In addition to fundamental aerosol studies, the Soviets also have conducted high-quality studies on the effect of atmospheric turbulence on aerosols. The results will be of value to the military in predicting the behavior of smoke and toxic CW agents released in the atmosphere under a variety of meteorological conditions.

The Soviets have an active program for defensive equipment development. They have developed protective masks and canisters, as well as decontamination and detection equipment, and are continuing

efforts to improve equipment currently in use. CW defensive research centers on the development and improvement of individual protective equipment. Polymeric compounds produced by Soviet scientists exhibit high heat-resistant, nonflammable, and antiblastic (bacteriostatic) capabilities. These compounds may find applications in all-purpose, chemical-biological-radiological materials for use in protective clothing. Some research is underway on collective protectors for combat vehicles.

Although the U.S.S.R. has shown an interest in radiological warfare (RW), its scientists are not known to have developed RW munitions. The major Soviet means of conducting radiological warfare, however, is expected to be surface-burst nuclear weapons.

3. Atomic energy

The Soviet nuclear energy program continues to be a priority effort, with the greatest emphasis on military applications. The nuclear weapon program has grown rapidly, and the Soviets have achieved great progress in weapons development. Tests of a wide variety of devices, with yields up to about 55 megatons have been detected. A number of these nuclear explosions have been detonated for various peaceful purposes. The U.S.S.R. has a large number of nuclear reactors for research, materials testing, production of electric power and process steam, production of plutonium and tritium for the weapons program, and propulsion of submarines and icebreakers. Uranium enriched in U-235 is produced for military and nonmilitary uses in four large gaseous diffusion plants. The Soviets have ample uranium ore reserves to meet their needs for the predictable future. They have a viable and extensive research and development effort with major programs directed toward the development of nuclear power systems for space applications and of controlled thermonuclear reactions (CTR).

Responsibility for all production aspects of the nuclear energy program rests with the Ministry of Medium Machine Building. A separate State Committee for the Utilization of Atomic Energy of the U.S.S.R. Council of Ministers supervises work on reactor design and research, the industrial use of atomic energy, civilian nuclear power development, foreign liaison and cooperation, and information activities. The U.S.S.R. Academy of Sciences both advises and conducts supporting research for the Ministry and the State Committee for the Utilization of Atomic Energy.

By mid-October 1970, the United States had detected 281 Soviet nuclear tests: 186 before the Limited Test Ban Treaty went into effect in 1963 and 95 afterward. Analysis of geophysical data and of nuclear debris from the tests held through 1962 indicated that the Soviets had developed a wide range of fission and thermonuclear weapons suitable for delivery by the systems assigned to the various branches of their armed forces. The absence of usable debris from the posttreaty underground tests has precluded weapon analysis.

The pre-1963 tests occurred at either the Semipalatinsk proving ground, the Novaya Zemlya area of the western Arctic, or the Kapustin Yar or Sary-Shagan missile test ranges. The Semipalatinsk proving ground was used for airbursts, groundbursts, and tower shots with yields in the low kiloton to low megaton range. The Novaya Zemlya area was used both for a few apparently naval-related underwater, surface, and low-yield airburst tests and for many airbursts of high-yield doubtless intended for strategic aircraft and missile systems. The Kapustin Yar tests may have been for the development of surface-to-air missile warheads, while the high-altitude bursts near Sary-Shagan in 1961 and 1962 appear to have been experiments designed to test portions of the Soviet antiballistic missile (ABM) system in a nuclear environment and particularly to study radar blackout caused by the detonations.

25X1

Following the test ban treaty, the Soviet underground test program got underway in March 1964. Most of the tests were held in the Semipalatinsk area and ranged from low through intermediate in yield; seven were held in the Novaya Zemlya area, including one on 14 October 1970 with an estimated yield of 6 megaton. Tests near Ufa, Azgir, Karshi, Tyumen', Perm', and Stavropol' indicate that the Soviets have an active program for the peaceful use of nuclear explosions. One of the events near Karshi extinguished a gas well fire that had burned for almost 3 years. At bilateral talks in Moscow and Vienna in 1969 and 1970 the Soviets described a number of peaceful uses experiments they had conducted, including the stimulation of unproductive oil fields, creation of oil storage cavities, and experiments in salt.

The Soviets have established national nuclear weapons stockpile sites throughout the country. Operational nuclear storage sites have been identified at many of the major Soviet airfields and have been associated with naval and ground forces; at least handling facilities probably exist at strategic missile sites as well.

Most of the advanced research and test reactors in the U.S.S.R. are found at three facilities: the Institute of Atomic Energy *imeni* I. V. Kurchatov, Moscow; the Institute of Physics and Power Engineering, Obninsk; and the Scientific Research Institute of Atomic Energy Reactors, Melekess. These reactors play an important role in the development of nuclear physics and nuclear power engineering in the Soviet Union.

The Soviet nuclear electric power generating capacity as of early 1970 was approximately 2,000 megawatts electrical (MWE). A large portion of this nuclear power is produced from the dual-purpose reactors located at Tomsk in Siberia, which reportedly were producing about 1,000 MWE in 1966. The remainder of the nuclear power is produced by reactors at Novovoronezhskiy, Beloyarsk, Obninsk, and Melekess.

Two additional nuclear power reactors are under construction at Novovoronezh. A dual-purpose nuclear power generation and desalination plant is being

constructed near Fort-Shevchenko. When it becomes operational in late 1971 or early 1972, it will be important to the Soviets' nuclear power program, because it will be their first large power reactor of the sodium-cooled fast-breeder type. A 600 MWE fast reactor (BN600) is also under construction at Beloyarsk. In the far north, a small nuclear power station consisting of four 12 MWE graphite reactors is under construction at Bilibino. In addition to the above, the Soviets are constructing two very large nuclear power stations near Leningrad and Kursk. Each of these stations will consist of two 1,000 MWE light-water-cooled, graphite-moderated reactors. They may employ one or both of two new Soviet reactor designs both of which employ boiling-water-cooled channels and one of which will have nuclear superheat.

The Soviets also have announced plans for nuclear power stations to be constructed on the Kola Peninsula and near Yerevan. These stations will consist of two 440 MWE pressurized water reactors of the Novovoronezhskiy type; this type reactor is being exported to Finland and East European countries as a standard commercial item.

The amount of uranium ores mined and processed in the U.S.S.R. and European Communist countries provides an annual production adequate for the estimated Soviet need for feed materials. The amount of uranium present in available reserves is adequate for the expected requirements of the nuclear energy program at least through the 1970's. Lithium and beryllium are produced in amounts sufficient for the needs of the program and industry in general, while other necessary raw materials are available in adequate quantities. A sufficient amount of heavy water is obtained from six or more small plants, and a large artificial graphite industry provides adequate quantities of reactor-grade graphite. High-purity magnesium, calcium, and zirconium metals are believed to be available in adequate amounts. The uranium metals plant capacity is large enough to support estimated Soviet needs.

Plutonium is being produced in large quantities, and tritium is being produced in significant amounts for the weapons program. As of mid-1970, the estimated Soviet cumulative production of plutonium was between 41 and 53 metric tons, with an annual production rate of about 5 metric tons. Plutonium equivalent production reactors and a plant for the chemical separation of plutonium from uranium and fission products have been in operation at Kyshtym since 1948. A graphite-moderated, water-cooled plutonium production reactor probably began operation in 1955 at the nuclear energy site north of Tomsk. In 1958 the first dual-purpose reactor which produces both plutonium and electric power was placed into operation at the site, and additional dual-purpose reactors are believed to have been built here since that date. There is a large nuclear complex at Dodonovo, north of Krasnoyarsk in Central Siberia, which probably has one or more reactors installed underground.

Enriched uranium is produced by the gaseous diffusion process in the U.S.S.R. Gaseous diffusion plants are located at four large industrial complexes located at Verkh-Neyvinskiy in the Urals and at sites near the Siberian cities of Tomsk, Angarsk, and Zaozernyy. In terms of equivalent weapon-grade (93% U-235) uranium, cumulative production is estimated at about 300 to 580 metric tons by mid-1970. In late 1969 the Soviets set the terms under which they will provide uranium enrichment services to nonnuclear Western countries that require slightly enriched uranium as power reactor fuel. The terms appear similar to those of the U.S. Atomic Energy Commission toll enrichment contracts. General agreements to provide enrichment services have been signed with both Finland and Sweden, but so far the Soviets have not negotiated any specific contracts for such services.

The Soviets encountered major problems in the nuclear propulsion systems of their icebreaker *Lenin* and their first-generation nuclear submarines. The *Lenin*, out of service since the 1966 navigation season, was fitted out with an improved reactor plant and returned to service in 1970. The Soviets have announced plans to build two more atomic icebreakers, probably using a reactor plant similar to the one installed in the *Lenin*. The problems the Soviets encountered in the first-generation nuclear submarine reactor plant generally have been overcome, and the early nuclear-powered submarines are now sufficiently reliable to conduct long-duration patrols. Since 1966, several new classes of nuclear submarines with new or improved nuclear reactor plants have been introduced.

The Soviets have shown considerable interest in electric propulsion system for space applications, for example, ionic and plasma engines. However, such propulsion systems using a nuclear power source are still in an early stage of development and are probably at least a decade away from becoming operational. They are exploring all the major energy conversion systems, including thermoelectric, thermionic, magnetohydrodynamic, and turboelectric generators. The Soviets also are engaged actively in the development of nuclear auxiliary power supplies for use in space.

The Soviet controlled thermonuclear reaction (CTR) research program is the largest in the world in terms of funding, manpower, and achievements. Work is being conducted in several of the major institutes, but at the present time the major effort is at the Kurchatov Institute of Atomic Energy. The Soviets have developed a device, the Tokamak, which has achieved the most promising results in the world in the area of CTR. A follow-on device, Tokamak T-10, is expected to be in operation in the 1974-75 period and could lead to the first demonstration of the technical feasibility of the controlled release of fusion energy.

The Soviet high-energy physics program features, among other facilities, the most powerful particle accelerator in the world, a 70-giga electron volt (Gev) proton synchrotron at Serpukhov. Experimentation is getting underway on this synchrotron.

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4. Electronics

The U.S.S.R. is a world leader in the quantity and quality of electronics research and development. Although lagging the United States in certain subfields, the Soviet work in electronics has continued to expand and has successfully closed many existing gaps. Important research is underway in telecommunications, space communications, electronic countermeasures (ECM), electronic warfare support measures, radar, lasers, computers, navigation aids, and semiconductor devices. The development of advanced electronic components continues to be emphasized and is supported by an extensive program in microelectronic technology. High-density circuits, thin-film techniques, micromodularization, and integrated microelectronic circuitry are under development. While some production is known, information is lacking on the quality, failure rate, and satisfaction of military specifications. This also applies to miniature components in high-density packaging. In a parallel effort, research and development of organic and inorganic semiconductor materials embrace a broad spectrum of devices, such as transistors, integrated circuits, diodes, and other comparatively new types. Soviet design philosophy for electronic equipment is based on a desire to achieve optimum performance and at the same time to achieve ruggedness in equipment and simplicity of operation. In addition, the tendency to use standardized components has alleviated the spare parts logistic problem. Research in information theory, generation and detection of submillimeter waves, and plasma physics is continuing and may provide important advances in related systems. The Soviets also are engaged in research and development efforts in systems which employ logic modules to enable automatic error detection and correction of transmitted printer data or similar communications.

Soviet research and development has produced significant advances in the country's communications capability. A satellite communication system provides TV relay and multichannel telephone and telegraph circuits, and a multiple access system is being developed. The Soviets have completed much of an extensive tropospheric scatter network stretching along the Arctic Ocean coastline from the Ural Mountains to the Bering Sea. With the development and installation of electromechanical crossbar switching systems and computerized electronic switching facilities, the U.S.S.R. is steadily progressing toward its goal of complete automation of the nationwide telecommunication system. The Soviets also have an operational radiocommunication link which employs ionized trails formed from the passage of meteors through the ionosphere to complete its transmission path. In addition, the advanced research on optical lasers has the potential of greatly increasing the capacity of Soviet communications. There is also an aggressive program to exploit the advantages of using the very low frequency (VLF) band in both radio communications and navigation equipment.

The U.S.S.R. has demonstrated a capability to jam, deceive, and conduct other effective countermeasures against most foreign radiocommunication, radar, identification, and navigation systems. Passive intercept and direction-finding equipment covers most of the radio frequency spectrum. Passive direction-finding equipment operating at frequencies up to 16.7 gigahertz and possibly as high as 37 gigahertz has been developed, and high-power jamming equipment operating from 500 kilohertz through about 10 gigahertz and possibly up to 18 gigahertz is in use. Developments are underway that may permit average output powers of 2 to 5 kilowatts over the frequency band from 10 to 20 gigahertz, respectively. Chaff drops have shown excellent characteristics over a broad range of frequencies. Research is being performed on absorbent materials, highly conductive metals, and dielectric ferromagnetics.

Increased emphasis on research and development of infrared sensors in the Soviet Union has been very noticeable during the last several years. The Soviets are known to have infrared-guided surface-to-air and air-to-air missiles and to have applied infrared to night-vision systems, such as covert vehicular driving and nighttime short-range reconnaissance systems. They are performing research on airborne electro-optical sensors in the visible and infrared regions to support various forms of airborne weapons delivery, fire control, and defensive functions.

The Soviets have developed a considerable variety of radars that, in a general sense, meet all military and civil needs. Past emphasis has been on developing successive generations of conventional designs, as well as on developing new designs. These usually have included increased power, more reliable components, and improved antenna designs. Despite the extensive borrowing of foreign technology, particularly that from the United States, the Soviets have developed some advanced radar designs embodying such techniques as coherent pulse, pulse compression employing frequency-modulation and phase reversal modulation, continuous wave operation, and electronic antenna beam steering. So far this capability has been evident primarily in radars operating below 1 gigahertz, but the Soviets apparently are concerned with almost all of the advanced techniques studied in the West, including such items as spread spectrum and random frequency jumping. The Soviet Union has continued efforts in the detection of radar targets at extremely long ranges. This effort has been directed to both line-of-sight and over-the-horizon (OHD) radars by using ionospheric refraction of the propagated wave.

The Soviets have developed several airborne radars incorporating advanced design and usage techniques (especially in antennas) and frequency-changing capabilities. The frequency range had been extended upward through at least 15 gigahertz. Among them are high-performance intercept radars suitable for universal (all-direction) attack, long-range missile target-spotting

radars for air-to-surface use, and navigational radars, including doppler systems. The Soviets have developed and produced airborne radar for airborne warning and control (AWAC), lobe-on-receive radars, side-looking antennas, and new air-to-surface missile guidance radars.

The Soviets have exhibited outstanding research and development in the laser field. The laser research and development program continues to expand, and applications-oriented activities are becoming more evident. The Soviets have improved and developed new versions of all three basic types of lasers—solid state, gas, and semiconductor. In addition, they have studied various kinds of materials for use in laser devices and have developed experimental techniques involving the use of these devices. Personnel of the Lebedev Physics Institute, Moscow, under the direction of Nobel Laureates N. G. Basov and A. M. Prokhorov, continue to generate many of the original ideas and proposals.

The Soviets have emphasized semiconductor laser development and have given much attention to optical and electron beam pumping of these lasers. Recent investigations have emphasized computer applications. In the solid state laser field, the principal devices under study are the ruby and neodymium glass laser. The Soviets have obtained very-high-power, short-pulse outputs with these types of lasers. They continue to pursue the development of high-power, short-pulse, oscillator-amplifier systems and in 1968 built and operated a multistage neodymium glass system capable of developing 3 terawatts in a 10-picosecond pulse; this laser represented the highest powered pulse laser system available in the world at the time.

Gas laser development is continuing. After a late start and slow initial progress in carbon dioxide laser development, the Soviets have announced power-per-unit length and efficiency figures for carbon dioxide electric discharge lasers that are comparable with those of the United States. Professors Basov and Prokhorov have published a number of papers on the thermally excited flowing gas carbon dioxide laser. The Soviets have claimed continuous operation of a 1-megawatt carbon dioxide gas dynamic laser; if verified, such an achievement would put the Soviets ahead of the United States in gas dynamic laser technology and would represent the highest continuous-wave power achieved with a laser. The Soviets have developed good helium-neon gas lasers for laboratory and industrial applications.

Significant research on chemical lasers has been conducted at the Lebedev Physics Institute and the Institute of Chemical Physics in Moscow. A peak pulsed power of 70 kilowatts can be inferred from reported experimentation with a hydrogen-fluoride system. The Soviets have not reported continuous laser action. Such a development is of military importance because of the mobility afforded to a laser with continuous action by virtue of its freedom from external power supplies.

Although there are no known laser systems presently deployed by Soviet military units, application-oriented

activity is becoming more evident. Reports of results from laser communication experiments, both in the laboratory and over outdoor paths up to 25 kilometers in length, continue to be released. The Soviets have used a helium-neon gas laser in an experimental 3-mile laser telephone communications link in Moscow. Several types of geodetic rangefinders having useful ranges out to 30 kilometers are available. Range-gating experiments utilizing a ruby laser have been reported. Laser radar astronomy and ranging against cooperative satellites are still of interest to the Soviets. Applied laser work has been noted in the areas of rotational rate sensors, holography, medicine, and metalworking.

The U.S.S.R. leads all other Communist countries in the design, development, and production of avionics (aeronautics and space associated electronics) equipment. The Soviets have not accomplished any breakthroughs in the avionics field, nor are their capabilities any stronger than those of the more advanced non-Communist countries. Nevertheless, the magnitude of their research and development effort and the importance the Soviets have accorded the entire field of study narrows the lead that Western countries have enjoyed in past years both in the quality and quantity of the avionics equipment produced.

The Soviets have given attention to air traffic control (ATC) and safety as evidenced by the special ATC radars and air-to-air and air-to-ground ATC-landing-identification aid. The aid serves as an airborne beacon for tracking, altitude, distance, and azimuth information, and it is suspected that it operates as a selective identification companion subsystem to the L-band Identification Friend or Foe (IFF). The newer electronic navigation aids and systems include self-contained star trackers. The trend is toward autonomous, self-contained navigation systems capable of operating anywhere in the world and independent of ground-based equipment.

The Soviet airborne antisubmarine warfare (ASW) capability has been improving with the development of electronic equipment and devices, including magnetic anomaly detectors (MAD), radars, and sonobuoys.

The Soviet Union has continued to expand the development of computers, particularly general-purpose digital and analog types. Computers are used throughout the economic, military, and scientific sectors of Soviet national life. Military authorities have emphasized the use of computers in command and control functions, and adequate computers have been available for both ground-based and onboard use in near-Earth space projects.

The Soviets have demonstrated a high interest in the development of new technologies applicable to computers but have experienced major difficulties in translating theoretical knowledge into good quality as well as quantity production end items. Two critical stumbling blocks have been the development and production of adequate peripheral devices and the mass production and assembly of integrated circuits into computing equipment.

The Soviets are working on techniques for employing pure fluid (pneumatic), laser, and optical devices in computers. The work on pure fluid computing devices stems from the growing need for automatic control in harsh environments in military as well as civilian projects. Work on optical devices is aimed at providing computers of higher speeds and greater capability.

Improvement of storage elements since 1965 has resulted in capabilities for core storage capacities of up to 500,000 words and core stores with access times below 1 microsecond. Recently, a small number of magnetic disc storage units have been produced, but magnetic tape and drums are still the main auxiliary storage devices. As in other parts of the industry, production of storage devices is hampered by inefficient production techniques and poor quality control.

Soviet software development has been impaired by lack of adequate internal high-speed storage capacity, inadequate input-output and auxiliary storage devices, lack of coordination among projects, and ineffective use of the limited number of systems analysts and programmers. The Soviets have exploited Western developments and have strong capabilities in the theoretical aspects of software developments. New models of computers and related equipment are becoming available from imports and domestic production, and software support as part of imported equipment is beginning to supplement domestic capabilities.

Despite the drawbacks, there is no evidence that any Soviet high-priority economic, scientific, or military programs have been significantly hampered by lack of adequate computers. The establishment of new standards for computers and related equipment and the development of new models like the RYAD and ASVT series of computers indicate that the Soviets gradually are overcoming many of their problems.

The Soviet military is emphasizing strongly the need to modernize the command and control of its armed forces through extensive use of computers. Their efforts extend from the basic decisionmaking process involved in the planning and execution of military operations to that of gaining optimal control of its weapon systems. Fire-control applications have been noted in artillery, missile guidance, antitank weapons, and antisubmarine warfare. Computers also are used in systems for defense against manned aircraft and ballistic missiles. Work on the design of parallel and multiprocessing computer systems is a step toward meeting future military computer requirements.

The Institute of Precision Mechanics and Computing Techniques (IPMCT), Moscow, under the direction of S. A. Lebedev, is the prime facility for development of large-scale digital computers. The BESM series of digital computers was developed here. In addition, the Institute of Applied Mathematics, under M. V. Keldysh in Moscow, and the Institute of Cybernetics, under V. M. Glushkov in Kiev, support the development and use of advanced computers for both military and

industrial projects. Other important centers in the Soviet digital computer industry include the Institute of Electronic Controlling Machines, under B. N. Naumov in Moscow, and computer plants in Penza, Minsk, Moscow, Kazan', and Ul'yanovsk. Analog computer development, since the early 1950's, has been centered in Moscow at the Scientific Research Institute for Computer Machine Building and the Institute of Automatics and Telemechanics, which also have been leaders in the development of hybrid computer systems.

5. Medical sciences, including veterinary medicine

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Significant improvements, attributable in part to the exploitation of Western advances and techniques, can be discerned in individual areas of biomedical research. Excellent studies have been conducted in the biochemistry of proteins. Research in many areas of space medicine is on a par with that in the United States. Original approaches are underway in epidemiological prediction, in biocybernetic research in virology, in immunology, and in the control of cancer and cardiovascular and infectious diseases.

The level of biochemical and biophysical research is improving considerably, and original work is underway. A Medical Biological Faculty has been created at the Second (Pirogov) Moscow Medical Institute explicitly to prepare personnel for fundamental research in biochemistry and biophysics. High-quality research is directed toward the regulation of biochemical activity of cell protein and toward the creation of artificial systems which reproduce the enzymatic and other functions of proteins. This work has achieved a uniquely successful reversible dissociation of ribosomes and proteins and presents new concepts for the mechanism of gene control. Competent research is underway on the structure and internal reproduction of viruses, the genetics of influenza and arboviruses, and the interaction of the virus with the cell.

Soviet molecular biophysicists are doing research that is comparable in some areas with the best in the world. Contributions include the application of optical or electromagnetic methods to the study of nucleic acids, protein, and muscle; the physical biochemistry of transfer RNA; and the study of tumor-producing viruses. Soviet X-ray diffraction studies of the enzyme and virus structures, while few in number, are of very high quality.

The level of Soviet aerospace medical research is on a par with U.S. work in many areas. The biomedical program is oriented toward the requirements of extended missions, including earth orbital stations and future lunar and interplanetary flights. Investigations are focused on unresolved stress problems of acceleration, weightlessness, and radiation, and adaptation to protection against these stresses. Studies emphasize optimization of crew performance and adaptation to confinement and inactivity, as well as related psychophysiological problems. Advanced

physical-chemical and bioregenerative life support systems are under development. Key research centers are the Scientific Research Testing Institute of Aviation Medicine in Moscow of the Soviet Air Forces and the Institute of Biological and Medical Problems of the Ministry of Health in Moscow.

The U.S.S.R. has stressed the exploitation of biocybernetics techniques in medical research. Investigations in this area have been improving steadily in quantity and quality. Important theoretical studies are underway at the Institute of Cybernetics, Kiev, in the development of mathematical models for the analysis of regulation, control, and interconnections in biological systems. Behavioral biocybernetic research continues to emphasize the Pavlovian conditioned response and the utilization of operant conditioning methods developed by Polish and Western scientists in studies of human behavior.

Soviet epidemiological research is undergoing a major change. Great emphasis is given to the application of mathematical and computer methods to epidemic disease surveillance, modeling, and prediction. Medical geographical studies are producing excellent atlases of communicable diseases based on these new approaches.

Research in microbiology places strong emphasis on the development of techniques for the control of infectious diseases. Research is centered on the study of variability of micro-organisms and bacteriophages, on rickettsiae, on natural foci of infections of man, and on chemotherapeutic control of disease agents. Basic virological research is substantial but essentially imitative of U.S. work. Infectious disease research is a major component of the general public health program. Investigations of plague and hemorrhagic fevers are excellent. Research in immunology has centered on the role of the various types of immunocompetent cells at successive stages of development and on the character of cellular differentiations during the process of antibody formation.

Although Soviet physiologists utilize advanced Western techniques in their research, the work lags that done in the United States and other Western countries. Special emphasis is directed toward neurophysiology and studies of man in extreme environments. Functional approaches to cells, tissues, and organs are pursued. Soviet bioinstrumentation research continues to improve. Adaptation on a limited scale of modern electronic instrumentation in medicine has resulted in individual achievements in radiotelemetry, electroencephalography, ballistocardiography, and computer processing of data from monitoring devices. The Soviets are continuing noteworthy exploitation of biocontrolled artificial arm prostheses, which were developed initially by them, and are continuing research on more sophisticated models of both upper and lower limb prostheses operated by consciously evoked nerve impulses. Artificial heart research is similar to that in the United States, but the research and development of other artificial organs lags U.S. efforts.

Cancer research, an area of priority effort, reflects Western approaches. New cytochemical methods are being developed for diagnosis of cancer, especially precancerous states and early forms of cancer. Chemotherapeutic procedures being applied include the use of alkylating and antimetabolic drugs. Strong contributions have been made in clinical oncology and in the epidemiology of cancer.

Competent but unoriginal pharmacological research is based on advances of Western scientists. However, the U.S.S.R. still relies on the Eastern European countries for research support for its pharmaceutical development. Soviet research on the role of drugs in central nervous regulation is of high quality. Superior work is underway in reversible and irreversible cholinesterases in cholinergic neural systems. Chemotherapeutic work is directed to practical applications and to the synthesis of neurotropic and antihypertensive preparations and of cardiovascular agents, myorelaxants, antiallergenics, and antiviral compounds. Broad programs are underway on the development of biogenic amines, antitumor antimetabolites, and biologically active substances in native medicinal plants.

The large volume of work undertaken in hematology is competent but essentially repeats work done in other countries; the Soviet effort lags this work by several years. In the field of cryogenics, research is more current with Western work and is oriented to the practical problems of freezing cells and tissues. Emphasis on plasma and plasma expander studies has led to the preparation of a chemically processed hemoglobin which can serve as a unique oxygen carrier in blood replacement fluids. Prostheses for blood vessels, heart valves, and filters for blood transfusion have been competently designed and employed. Diagnosis of blood dyscrasias employs electron microscopic, radiologic, and scanographic techniques.

The U.S.S.R. employs Western-developed technology in radiobiology. Interest is strong in the identification of radioprotective chemicals among the thiol, amine, and hypoxic agent groups and the identification of effective polymer complexes of these chemicals. Good results have been achieved in the use of radioisotopes in the study of local ventilation and blood flow in the lungs, and in the location of brain tumors. Medical radiologists have developed algorithms for computer assistance in X-ray diagnosis of disease. Successful induction of bone sarcomas in monkeys through chronic administration of radioactive substances has contributed to the clinical evaluation of this disease.

The various medical programs inspired by Soviet military requirements probably cover as wide a range of fields and disciplines as those in the U.S. military services. The Ministry of Defense provides financial support and dictates programs and priorities to the Academy of Medical Sciences of the Ministry of Health. The Learned Medical Council of the Main Military Medical Directorate under the Ministry of Defense plans and supervises military medical research. The

S. M. Kirov Military Medical Academy in Leningrad coordinates all military research and development conducted in military and civilian institutions. The Soviets depend heavily on civilian medical establishments to provide research and development support for the military. Army medical research is concerned with the treatment of mass casualties, environmental health, physiology, and medical aspects of chemical, biological, and radiological warfare. The N. N. Burdenko Main Military Hospital in Moscow conducts research in burns and radiation pathology; it utilizes computers in diagnoses and studies the application of cybernetics to military medical problems.

Soviet veterinary research is not impressive. The veterinary research capability of the Soviet Union does not compare favorably with that of the United States but is comparable to that of the less advanced Western countries. Research institutes of the academies of sciences appear to have research programs of higher quality and sophistication than those of the veterinary laboratories of the Ministry of Agriculture. The government has provided substantial support to improve veterinary scientific facilities and training. The academy institutes are better equipped, and the scientists are younger and better trained. Basic veterinary educational standards are approximately equivalent to those in other technically advanced countries, but postgraduate activity lacks the intensity and sophistication attained in other countries. The most important veterinary research facilities are the All-Union Institute of Veterinary Science, the All-Union Institute of Helminthology, the All-Union Scientific Institute of Veterinary Sanitation, the State Scientific Control Institute, and the Moscow Veterinary Academy, all in Moscow; and the Leningrad Veterinary Institute. The D. I. Ivanovsky Institute of Virology of the U.S.S.R. Academy of Medical Sciences in Moscow conducts virological research which has veterinary medical application.

Soviet veterinary research is primarily applied with emphasis on the development of improved biologicals for the further control of the economically important animal diseases. Only a few veterinarians provide health care for laboratory animals used in biological and medical research and only minor effort is devoted to comparative biomedical research. Although the Soviets have demonstrated their ability to contain outbreaks of foot-and-mouth disease, during 1968 about 1,300 outbreaks occurred primarily among cattle, swine, and sheep. The Soviet veterinarians also are concerned with the control of anthrax which has caused severe losses among reindeer. Other diseases of concern to the Soviets are leptospirosis, tuberculosis, hog cholera, brucellosis, rabies, salmonellosis, and tularemia. Parasitic infections which limit animal production and are of public health significance receive considerable research attention. The Soviets also are doing research on toxicity of extoparasite pesticides and are studying pesticide residues to determine cumulative effects. DDT is no longer used on livestock.

6. Other sciences ()

a. CHEMISTRY, CHEMICAL ENGINEERING, AND METALLURGY—Chemical and metallurgical research and development programs have been continued as major efforts in the U.S.S.R. because of their importance to military and industrial advances. The Soviet Union leads the United States in some narrow areas but lags in overall progress and achievements in these fields and is stronger in the basic than in the applied aspects.

(1) *Chemistry and chemical engineering—*

Failure of the chemical and related industries to take full advantage of scientific advances and laboratory findings has resulted in much obsolescence in Soviet industry. Authorities recognized this situation soon after World War II and ever since have made efforts to modernize these industries, even going to the length of importing complete plants and processes from foreign countries. These and related training efforts are slowly improving the situation, and in addition Soviet engineers have developed a few processes that have been purchased by such highly developed countries as Sweden.

Physical chemistry is a field of research in which the Soviets have done some notable work, winning a number of international awards and a Nobel Prize. High-temperature thermodynamics, including the properties of liquid metals and vapors, has been studied extensively in support of power engineering development both for nuclear and conventional thermal-electric plants. Considerable high-temperature research has been conducted on the kinetics of explosions and chain reactions. Emphasis has been placed on developing specialized experimental and theoretical techniques for studying reaction processes and intermediates. Since these studies are applicable to developing an understanding of the type of molecular and ionic reactions that occur in space, the Soviets currently are applying many of their findings to space-oriented studies. They have continued their work in adsorption and catalysis as applied to industrial processes as well as in the basic studies designed to explain such phenomena. The field of basic catalysis research has declined in prominence in recent years with the death of some of the more prominent research workers such as A. A. Balandin. Research in electrochemistry has received increased emphasis, and high-quality work on fundamentals is being conducted under the leadership of A. N. Frumkin and V. G. Levich. Applied research is directed toward the development of improved batteries and fuel cells suitable for use in remote locations or spacecraft. Although the Soviets are behind the United States in fuel cell development, they have been making significant progress due to the work of V. S. Bagotskiy.

Soviet research in organic chemistry continues to be behind that of the West in general quality, although the U.S.S.R. has scored notable successes in the chemistry of organophosphorous compounds and of synthetic rubber.

There is a continuing large effort to synthesize polymers for high-temperature service. Research on nitrogen-containing structures such as the polybenzimidazoles and the polyarylamides is replacing their earlier attention to organometallic compounds. In 1964 there was practically no Soviet work on polybenzimidazoles, but today their effort is comparable in size and quality to that in the United States. Epoxy compounds also are receiving increasing attention because of their utility as a resin for the matrix in fiber-reinforced composites and because of their excellent adhesive properties. Another area of Soviet synthetic organic chemical research that is receiving a good-quality scientific effort is the development of radiation-resistant polymers.

The Soviets have concentrated on the study of microbial degradation since 1960. Some of the research on biodeterioration has been conducted in cooperation with military specialists. In 1968 a Council on Theoretical Problems Associated with Biologically Damaged Materials was established within the U.S.S.R. Academy of Sciences. The range of materials examined by Soviet scientists for biologic susceptibility has expanded substantially. Environmental effects, particularly in the tropics, have been studied on such products as celluloses, electronic equipment, missilery, optical instrumentation components, plastics, POL, and rubber.

Soviet synthetic fiber technology is improving with the successful exploitation of polyethylene terephthalate processes and of those for making certain nylon-class fibers and fabrics. The Soviet Union, however, still lags the West in fluorocarbon technology and in the development of fibers and fabrics from new polymers like the polyarylamides.

Inorganic chemical research in the U.S.S.R. is broad in scope, although not so extensive in depth as Western work. Recent interest in developing materials with specific electric or electronic response has stimulated much inorganic research. This work, particularly that on semiconductors having special properties, has resulted in greatly increased activity in improving analytical methods. Many new inorganic materials of natural or of synthetic origin are being studied to meet the needs of the Soviet electronics industry.

The possibility of using the phenomenon of superconductivity on a wider scale has stimulated inorganic chemical research on both metallic alloys and on other inorganic materials such as intermetallic compounds and ceramics. Some research is in progress on inorganic polymers with the objective of finding a new electronic material, but more generally to develop improved materials for high-temperature service. Inorganic fibers are being studied as reinforcement for composites. The Soviets have a well-established effort to produce good-quality carbon fibers and probably are working to improve other fibers being made from metals like copper and tungsten and from nonmetals like boron.

The principal strength of the Soviets in the field of chemical engineering is in mathematical applications to

studies of various chemical engineering unit operations. In this area they are about on a par with the United States; however, in the more applied aspects of the field, they are considerably behind the United States. The Soviets continue to have difficulty in scaling up chemical processes from laboratory to plant scale in spite of a concerted effort of many research institutes to establish closer contacts between the scientists and design bureaus. Although considerable publicity has been given to the Soviet offer to sell chemical processes to other countries, purchases by them of foreign know-how and entire chemical plants has not slackened.

The U.S.S.R. has an extremely broad program of research on heat transfer with sodium systems which has application in nuclear reactors. Knowledge gained in rocket propellant combustion studies is being used by the Soviets in an attempt to develop a low-temperature plasma process for the fixing of atmospheric nitrogen. In the area of cryogenic technology the Soviets are closing a gap by the use of multilayer (super) insulation for storage and transport vessels for liquefied gases.

The Soviets recently developed a novel plate and frame filter press which offers some of the advantages of the continuous rotary drum filter in that only a minimum of down time is required before reuse. In the generation of ultrahigh pressures the Soviets have developed equipment for experimental research that is among the world's best. Conversely, the Soviets had under construction in June 1969 their first vacuum evaporator for concentrating sulfuric acid, something available in the United States for over 30 years. Between these two extremes Soviet chemical engineers have developed a technique for the final purification of argon from air liquefaction and distillation by the use of low-temperature adsorption on synthetic zeolites. For the most part, the Soviets are behind the United States in adsorption application but on a par in adsorption theory.

The U.S.S.R. has a fairly extensive research program underway for new missile propellants, but the chances of their being used in operational systems in the near future is slim because of high cost, sensitivity, toxicity, and the problems inherent in replacing systems that are already established. One propellant for which a need exists and which is expected to be used in a Soviet missile in the near future is liquid hydrogen.

Soviet research published in open literature reveals that the U.S.S.R. is quite active in solid propellants. Solid propellant ICBM and MRBM prototypes have been under test for several years but do not appear to threaten the Soviet use of liquid propellants in these systems. The Soviets have worked with both composite and double-base solid propellants. The most likely composite propellant is ammonium perchlorate and polybutadiene or polyurethane. In consideration of their extensive experience with double-base propellants, it is very likely that the Soviets have developed composite-modified double-base propellants.

Research on the physical phenomena of explosions, such as detonation and shock waves, is at a high level.

The Soviets use massive charges of explosives for damming, mining, and building irrigation ditches and canals. Research on explosives compositions is increasing. Work has been done on DATB (diaminotri-nitrobenzene), a high-temperature stable explosive. A Soviet patent appeared in October 1967 on dipicryloxadiazole, which is under investigation in the United States as a promising high-temperature explosive. The Soviets also are believed to be working on slurry explosives, which are used to increase the versatility of explosives for commercial application. To further their research activity the Soviets have an explosion chamber of over 400 cubic meters, which is used to determine the efficiency of a test material on rocks and metals.

There seems to be increasing exploitation by the Soviets of HMX (tetramethylenetetranitramine), probably the highest energy chemical explosives in common use at the present time. A Soviet patent was issued on a "thermally stable explosive" containing 75% HMX and fluorocarbon plastics. The use of plastic and preformed explosives by the Soviets is on the increase.

(2) *Metallurgy*—Soviet metallurgy is broad in scope, is strongly supported, and in most areas of technology is generally comparable in quality to that in the West. The overall level of competence in metallurgical research continues to be lower than that of the United States, but in recent years the Soviets have been narrowing the gap. Large defense-related requirements for a variety of specialty alloys have done much to strengthen overall capabilities. The Soviets have increased significantly the scope and improved the quality of their applied metallurgical research in order to meet national needs.

The U.S.S.R. is behind the West in physical metallurgy. Nevertheless, the Soviets are improving the quality of their activities in this field and, in terms of the scale of effort, are world leaders in the specific area of determining equilibrium-phase diagrams of metals. Much of this work has dealt with materials for advanced technological applications such as semiconductors, refractory metals, gas turbine alloys, light metals, and nuclear alloys. Attempts to predict metallurgical phase equilibria with computers have been reported.

The Soviets have placed a top priority on improvement in the quality of steel. The Soviets have been engaged for several years in research on new low-alloy, high-strength steels, some of which are used in military applications. Soviet metallurgists have developed a full range of stainless steels, including precipitation-hardening types that are important where high strength and corrosion resistance are necessary as in aircraft structures and turbine compressor casings. They have reached parity with the United States in the development of superalloys for high-temperature parts of jet engines. Extensive work has been done on the development of a chromium base alloy for use between 1,000°C. and 1,200°C. The use of both electroslag remelting and vacuum processing of stainless steels and other special-purpose alloys is highly developed.

The most important center of ferrous metallurgical research is the Central Scientific Research Institute for the Iron and Steel Industry *imeni* I. P. Bardin in Moscow. The institute conducts an interdisciplinary program of ferrous metallurgical development and is well-equipped, having a complete pilot-scale steel works.

The U.S.S.R. has a large program to develop and employ thermomechanical treatment of alloys, a combination of deformation and thermal processing to improve the mechanical properties of metals. Despite some previous problems in adapting the technique on an industrial scale, the Soviets are believed to be progressing in its application. In the metals fabrication industry, they have developed improved electrical and ultrasonic machining processes and equipment, advanced casting techniques, and larger extrusion and forging presses. Welding technology is a source of Soviet pride, and the highly specialized Institute of Electrowelding (IES) *imeni* Ye. O. Paton in Kiev is probably the largest and one of the best welding research and educational facilities in the world.

One of the key institutes providing specialized metallurgical research support is the All-Union Institute of Aviation Materials in Moscow whose efforts are concentrated on materials for aircraft structures and engines as well as nuclear systems. Also in the Moscow area is Scientific Research Institute (NII) 88 which is involved with materials and manufacturing methods for missiles and space boosters.

Nonferrous metallurgical process technology has continued to grow rapidly. Although the Soviets have invested heavily in research and development of methods to use nonbauxitic ore for the production of aluminum, they are having problems getting the process technology into production. The Soviets are producing a full complement of modern aluminum and titanium alloys, and their development capabilities in these areas are equal to those of the United States. Titanium products are being used increasingly for civilian as well as military applications.

The U.S.S.R. has a highly developed nuclear materials capability supporting the power and propulsion reactor, as well as the nuclear weapon programs. Good procedures have been developed for obtaining the basic materials—uranium and plutonium. The Soviets also have continued work with definite progress on new techniques for the separation of hafnium and zirconium, and on the production of beryllium, all of which play important roles in a nuclear energy program. The chief center of research in nuclear materials is the Institute of Atomic Energy *imeni* I. V. Kurchatov in Moscow, where much of the metallurgy of unique concern to nuclear weapons probably is being performed within classified laboratories. The State Scientific Research Institute for Rare Metals (GIREDMET) in Moscow also has been actively supporting the Soviet nuclear program.

b. PHYSICS AND MATHEMATICS

(1) *Physics*—The Soviets have an excellent capability in most areas of basic physics research including many aspects of theoretical and nuclear physics, solid state physics, and optics and infrared. In addition, the U.S.S.R. has an outstanding overall capability in mathematics with particular emphasis on applied aspects.

The Soviets have a vigorous theoretical and nuclear physics research program. The emphasis has shifted from such topics as many-body streams and quantum liquids to theoretical studies of nuclear structure. The Institute of Theoretical and Experimental Physics at Moscow, the Joint Institute for Nuclear Research (JINR) at Dubna, and the Institute of Nuclear Physics at Novosibirsk are centers of theoretical research.

The Soviets have adequate equipment for low- and high-energy physics research, including many standard cyclotrons and other common low-energy accelerators. A 25-Gev proton-antiproton storage ring, the world's largest, is under construction at the Institute of Nuclear Physics in Novosibirsk; other new types of machines, including microtrons and high-current betatrons, are being designed and built. A low-energy accelerator for heavy ions and a 680-Mev synchrocyclotron at the JINR have performed well for a decade. A moderately successful 7-Gev proton synchrotron operates on a routine basis; a 10-Gev accelerator, however, is operated at low intensity and may be shut down permanently. The Soviets have other machines for high-energy physics research, including a 2-Gev linear accelerator, a 6.5-Gev proton synchrotron, and a 1.3-Gev miniature electron synchrotron. The Soviets placed in operation during 1967 a 6.5-Gev electron synchrotron at the Institute of Physics in Yerevan and the well-designed 70-Gev proton synchrotron at the Institute of High-Energy Physics at Serpukhov; the latter is the highest energy machine in the world.

In hope that they might achieve spectacular results at a fraction of the cost of standard techniques, the Soviets also have been experimenting with unconventional accelerators. For instance, at the Institute of Nuclear Physics in Novosibirsk, two 169-Mev electron beams are made to collide; the results are similar to those achieved with conventional accelerators of 20 times greater energy.

The Soviets have the largest and most competent magnetohydrodynamics (MHD) research and development program of any country and lead the world in work aimed at practical applications of MHD developments. They are constructing in Moscow a unique MHD pilot power plant, a fossil-fueled facility, which is scheduled for operation around 1972.

In solid-state physics, the Soviets continue to place heavy emphasis on semiconductor materials research and development. For example, the Soviet ability to prepare silicon is comparable to that of the United States with the exception of the purity level needed for devices with low noise requirements. The Soviets

continue to improve their technique for producing high-quality silicon and are conducting silicon research which provides valuable information about band structure and suggests means of controlling resistivity. Soviet studies of germanium are more thorough than of any other conventional semiconductor material, and the knowledge acquired about semiconducting germanium is used as a reference in studying new materials. The Soviets also are studying the properties of other conventional semiconductors, such as the sulfides, tellurides, and related compounds.

A large number of binary and ternary crystalline compound semiconductors have been prepared and tested, giving the Soviets a large selection of new compounds, sometimes with unique properties. The preparation techniques employed are excellent, and the purity of the compounds is sometimes higher than that obtained in the West. Immediate device application is not evident for many of these compounds, but the Soviets are believed to be developing some compound semiconductors for special uses. Gallium arsenide solar cells, which they have produced for and used in at least one satellite, are reportedly as efficient as silicon solar cells and have the advantages of being more radiation resistant and operable at higher temperatures than the silicon cells. The Soviets also are producing some of the world's best electronic grade silicon carbide which is capable of higher temperature and higher power operation than any other known electronic material. It is being used in nuclear particle detectors for reactors.

The Soviets have prepared many of the binary and ternary compounds in the amorphous (noncrystalline) phase. The amorphous semiconductors are more radiation resistant and less sensitive to impurities than the crystalline semiconductors. Currently the Soviets have the world's largest effort in the preparation and studies of the properties of these materials and are believed to have a large classified program for the development of devices employing amorphous materials. Such a program could provide an important contribution to Soviet military solid state equipment, since the resultant devices would be more radiation resistant than similar devices fabricated with crystalline semiconductors.

The U.S.S.R. continues to expand its excellent capabilities in both the scientific and military applications of infrared (IR) technology and the extent of the effort is possibly equal to the combined efforts of Western countries. There are no indications, however, that the Soviets are having any more success than the West in overcoming the inherent limitations of IR techniques in military applications. The most significant application of Soviet IR continues to be systems and devices for night observation of ground forces. Several air-to-air missiles are known to have IR terminal guidance (homing) models as well as IR fusing, including the AA-2 (ATOLL) and a version of the ANAB and ASH. Naval use includes a number of devices for visual operations from ships under blackout conditions,

such as station keeping, docking, and possibly as a backup to some radars for fire control. Space applications include horizon sensors for satellites and probably for space probes. IR is used in meteorology for determinations of the thermal balance of the earth, as well as for weather satellite surveys.

Extensive and high-quality basic research programs in physics, physical chemistry, and electronics support the infrared program. The Soviets have developed fast photon detectors for the important atmospheric window in the far IR—the 8-13 micron region—and are active in the investigation of mercury-cadmium telluride, the newest material for this type of detector. Although Soviet scientists have placed heavy emphasis on the much slower thermal IR detectors, they do not appear to lack either suitable detector materials or most of the detector fabrication technology required for modern IR systems. They are not believed to have developed operational high-resolution line-scan equipment for airborne reconnaissance. Much of the IR research and development activity is concentrated in the Moscow and Leningrad areas. In Moscow the Lomonosov Moscow State University, the Lebedev Physics Institute, the Institute of Radio Engineering and Electronics, and the Institute of Crystallography are important facilities; in Leningrad the Institute of Semiconductors, the Physico-Technical Institute, the Leningrad University, and the Vavilov State Optical Institute are active in IR work. The last facility is probably the most significant for basic IR research, as well as for the development of military IR devices and systems and for trial or limited production of some items.

(2) *Mathematics*—The U.S.S.R. continues to expand its very high capabilities in mathematics. Soviet mathematicians are among the world leaders in every important area of modern mathematics. There has been a strong emphasis on applied research to solve immediate problems, but excellent basic work continues in such subjects as algebra, functional analysis, mathematical logic, and topology. The greatest volume of work has been on differential equations, numerical analysis, and other subjects related to practical applications.

Soviet mathematicians have maintained their traditional strength in ordinary differential equations with the major emphasis given to topics related to automatic control theory. Mathematicians also have an impressive capability for research on partial differential equations, as well as considerable strength in applying the results of their research to the solution of practical problems in physical sciences and engineering. Many highly competent young mathematicians have joined such internationally renowned researchers as M. A. Lavrentyev, S. L. Sobolev, I. V. Vekua, and M. V. Keldysh in doing strong research on problems related to hydrodynamics and mechanics, fields which have a broad range of application in military and space efforts.

There is a large and growing effort on subjects pertinent to the development of improved computa-

tional techniques, with emphasis on methods suitable for use with computers. In numerical analysis, much of the work has concerned the solution of practical problems at computing centers; some of the most notable work is that of A. A. Dorodnitsyn at the Computing Center at the U.S.S.R. Academy of Sciences in Moscow and of G. I. Marchuk at the Computing Center of the Siberian Department of the Academy of Sciences in Novosibirsk on computational methods for applied hydrodynamic problems. Research in functional analysis by such leading figures as I. M. Gelfand, M. G. Kreyn, and L. V. Kantorovich is aimed at improving methods for approximating the solutions of equations and supports improved practical computational techniques. The need for better computational methods in economic planning also has motivated a considerable volume of recent work and many eminent mathematicians throughout the U.S.S.R. have been concerned with the methods of linear and dynamic programming.

The Institute of Mathematics *imeni* V. A. Steklov of the U.S.S.R. Academy of Sciences in Moscow, with branches in Leningrad and Sverdlovsk, has a central role in Soviet mathematics. The Institute of Mathematics of the Siberian Department of the U.S.S.R. Academy of Sciences in Novosibirsk, which includes several outstanding mathematicians formerly in the institute in Moscow, also has achieved prominence as a research center for mathematics, especially in subjects related to computer design and applications. Another important center for mathematical research related to computer applications is the Institute of Applied Mathematics of the U.S.S.R. Academy of Sciences in Moscow; it was formed from a department of the Institute of Mathematics that was concerned with problems in space mechanics and missile control. The departments of mathematics of major universities have strong programs in a broad range of topics. Individuals and small groups in educational and research facilities also make significant contributions in specialized subjects.

C. *ASTROGEOGRAPHICAL SCIENCES*—The U.S.S.R. carries out a large and comprehensive research program in the astrophysical sciences. Soviet scientists are recognized as among the world leaders in these fields, but the quality of their research and their accomplishments generally lag behind those of the leading scientists in the most advanced Western countries. In almost all areas of the astrophysical sciences, lack of the more sophisticated instruments found in the West probably accounts for at least some of the lag. The use of outmoded data processing techniques probably is also a contributory factor. Nevertheless, progress is being made and some very good research is being conducted in almost all of the astrophysical fields. The Soviets maintain a large geophysical research effort in the Polar regions. Much of this effort contributes directly to the support of military plans and operations, many of which must be carried out in the Arctic region due to the geographical location of the U.S.S.R.

(1) *Astronomy*—The U.S.S.R. is very active in astronomy, but its achievements continue to lag those of the United States. The Soviets are traditionally excellent in theoretical astronomy. Probably the best research is underway in studies of the solar system, the solar magnetic fields, stellar physics, positional astronomy, and celestial mechanics. Soviet astronomers support the national space program by making short-term solar flare predictions, by operating a network of optical satellite tracking stations, and by calculating orbital characteristics for earth satellites and space probes.

Observational capabilities are improving as new telescopes are installed and equipment at observatories is modernized. The largest operating telescope in the U.S.S.R. is a 2.6-meter telescope located at the Crimean Astrophysical Observatory, Simeiz. A similar telescope is being constructed at the Byurakan Astrophysical Observatory, Byurakan. In 1967 a large Zeiss telescope with a 2.0 meter objective mirror was installed at the Shemakha Astrophysical Observatory at Shemakha, 90 miles from Baku on Mount Pirkuli. The Soviets are constructing at Yelenchuskaya a 6-meter telescope, the world's largest, but its performance may not surpass that of other large telescopes now operating elsewhere because of the poor atmospheric conditions at its location in the Caucasus Mountains. In 1968 the Soviets began operating the Cerro Robles Observatory in Chile jointly with the Chileans and are considering the construction of an observatory with a 2.6-meter telescope in northern Chile. Most of the equipment used in Soviet observatories, except the newer optical devices, resembles that used in the West one or two decades ago.

Lunar research is diversified and includes studies of the optical properties of the lunar surface, the physics of meteor impact cratering, and lunar volcanology and radio investigations. In their lunar probes, the Soviets have continued the lunar photography program and have measured physical properties of the lunar surface. The Soviets have conducted some competent studies of Mars and Venus by means of radio and radar observations from earth and have acquired data on the Venusian atmosphere from planetary probes.

Solar physics research is extensive and pursued intensively at the Crimean Astrophysical Observatory. Original research and advanced instrumentation for investigating solar magnetic fields characterize the program under A. B. Severney at the Crimean Astrophysical Observatory. Solar flare predictions are made routinely at the Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation (IZMIRAN), Krasnaya Pakhra. The world's largest coronagraph was installed in 1967 at the Kislovodsk Mountain Astronomical Station of the Main Astronomical Observatory at Pulkovo; the station is located on the north slope of Gora El'brus. A duplicate of this instrument was later installed at IZMIRAN.

(2) *Meteorology*—The U.S.S.R. is one of the leading countries in meteorology. The Main Administration for Hydrometeorological Services (GUGMS), subordinate to the U.S.S.R. Council of Ministers, is responsible for providing operational support to both civilian and military users. To carry out this responsibility the GUGMS maintains a large observational network, prepares many types of general and specialized weather forecasts, and conducts research in a wide variety of subfields of meteorology. Much of the research done by GUGMS is directed toward improving the quality of weather forecasts, developing improved instrumentation, and attempting to modify natural atmospheric processes for economic and military purposes. Other meteorological research, generally of a more theoretical nature, also is conducted by several institutes of the U.S.S.R. Academy of Sciences.

Some of the most significant forecasting research undertaken in the U.S.S.R. is in the area of numerical weather prediction and related fields such as atmospheric modeling. Advanced theoretical research in these fields is conducted at the Computing Center of the Novosibirsk Division of the Academy of Sciences and at the Hydrometeorological Center, Moscow, under GUGMS. While this research is comparable in quality with that carried out by the most advanced nations in the world, the Soviets continue to have problems in introducing the more advanced techniques into operational service. These problems are due largely to the unavailability of suitable computers for this purpose.

In general, the Soviets have not been leaders in designing and developing meteorological instrumentation. Many of their basic observational type instruments are rather crude by Western standards, and their standard radiosonde is still plagued with abnormally large radiational errors in temperature measurements. However, the MRL-1 weather radar, recently placed in operational service, appears to be an outstanding instrument capable of operating at both centimeter and millimeter wavelengths. The Soviets are planning a major modernization of their observational network in the 1970's which will include extensive use of automatic instrumentation.

The Soviets maintain one of the world's largest research and development programs in weather modification. The Soviets developed an operational method for dispersing supercooled clouds and fogs in the 1950's, and for 10 years have concentrated their efforts on developing a method for hail suppression. Since this work on hail suppression appears to have reached the operational stage the Soviets probably will concentrate a major effort on some new aspect of weather modification in the near future. Some other areas in which the Soviets have expressed interest include large area modification, modification of cumulus clouds and thunderstorms, warm cloud and fog dispersal, and precipitation augmentation.

Soviet meteorologists launched their first successful weather satellite in mid-1966, and the program has advanced to the point where three or four Meteor satellites are in orbit simultaneously. With this number of active satellites, the Soviets are approaching the operational capability of obtaining data from every point of the globe each 24-hour period. Instrumentation on the Meteor satellites has changed little since the program first began. The Soviets have tested advanced meteorological instrumentation in space, including infrared experiments to determine atmospheric vertical temperature profiles and passive microwave radiometry. These experiments have been flown on other satellites of the Cosmos series and have been developed by personnel from the U.S.S.R. Academy of Sciences rather than GUGMS personnel. Nevertheless, it is likely that experiments similar to these eventually will be included on the Meteor satellite payloads.

(3) *Space and upper atmospheric sciences*—The Soviet space science program is second only to that of the United States, and since the beginning of the space era the U.S.S.R. has been able to score several firsts. Almost without exception, however, no major scientific discoveries in space have been reported by the U.S.S.R. This is probably due to several factors, among which are the secrecy of their program, inferior instrumentation, and poor data processing facilities. The Soviet upper atmospheric research program, both ground-based and rocket-borne, also is large in magnitude and scope but generally has produced few new results.

The Soviet scientific space and upper atmospheric research programs are directed by the U.S.S.R. Academy of Sciences. The Academy's Commission for the Exploration and Utilization of Space (CEUS) is responsible for coordinating the overall scientific space program, and the Council on International Cooperation in the Study and Utilization of Outer Space (Intercosmos) serves as an advisory organ for maintaining international ties. Many institutes and observatories in the academy and in other organizations such as GUGMS are engaged actively in space and upper atmospheric research. Some of the more prominent of these facilities include the Academy's relatively new Institute for Space Research and the Institute of Atmospheric Physics, both in Moscow, and GUGMS' Institute of Applied Geophysics in Moscow and Central Aerological Observatory at Dolgoprudnyy. Moscow State University and Leningrad State University also are active participants in these research efforts.

The Soviets generally use the Cosmos satellites to study the upper atmosphere and the near-earth space environment. With these satellites, they have collected data on the radiation belts, primary cosmic rays, solar ultraviolet, infrared, and X-ray radiation, soft corpuscular radiation, micrometeorites and cosmic dust, earth and interplanetary magnetic fields, and upper atmospheric and ionospheric structure. They have made some unique measurements of very high energy cosmic

rays with their heavy Proton satellites. While they have collected much information on the micrometeorite concentration in near-earth space, recent Soviet investigations have shown that the majority of these experiments were conceived poorly and have produced erroneous results. There are indications that the Soviets plan to use manned space stations to a considerable extent in the future to supplement unmanned satellites in collecting scientific data, including information applicable to meteorology, oceanography, and earth resources studies.

The Soviets have placed a high priority on lunar and planetary investigations, but their results have not been outstanding due to the high failure rates of the launch vehicles and the instrument packages. After the 7-year period between 1959 and 1966 during which no Soviet lunar or planetary probe successfully completed its mission, they have landed three spacecraft on the moon, placed five around the moon, and sent four around the moon and back to earth. In 1967 and 1969 the Soviets also were successful in entering the atmosphere of Venus with the *Venus 4*, *5*, and *6* spacecraft; as of October 1970, *Venus 7* was on its way toward Venus. The Soviets have obtained some unique *in situ* measurements of the atmospheric properties of Venus. They claim to have received data not only down to but also after impact on the surface of Venus. Despite the recent lunar successes, the quantity and quality of data collected has been much lower than that obtained by the U.S. lunar program. The *Luna-16* mission, which successfully returned samples of the lunar soil to earth, was more of a technological than scientific accomplishment.

Data collected by means of earth satellites is supplemented by means of ground-based and rocket measurements. The Soviets collect by means of ground-based instruments a large amount of ionospheric and auroral data, much of which is obtained in Polar regions. They have produced little outstanding research based on these data, but they have gained a good understanding of the theoretical aspects of electromagnetic wave propagation, which is dependent on a knowledge of the ionosphere. The Soviet rocket sounding program is designed to collect a wide variety of information, including data on the structure and composition of the upper atmosphere, on the concentration of charged particles, and on the characteristics of solar and corpuscular radiation. The Soviets admit to launching vertical sounding rockets at only two launch sites within the borders of the U.S.S.R.—Ostrov Kheysa in Franz Joseph Land and a site near Volgograd. In addition, they also have equipped several of their ocean-going research ships with rocket launching capabilities, and recently they have begun launching rockets at their Molodezhnaya station in the Antarctic. With these additional launch facilities, the Soviets have stepped up considerably the number of launches since 1968. However, during the same time period, the Soviets began to rely mainly on a rocket vehicle capable of reaching an altitude of about

180 kilometers (km.) compared with a 500-km. capability for the rocket they formerly used. By doing this they improved their data collection program with respect to the amount of geographical area covered and to the number of rockets launched, but the new rockets did not go high enough to make measurements in the F region of the ionosphere. Three 1970 launches indicate that the 500-km. rocket program has been resumed. This should help to balance the overall Soviet vertical rocket sounding program.

(4) *Terrestrial geophysics*—The U.S.S.R. ranks with the world leaders in terrestrial geophysics research. In terms of manpower the Soviet effort in many of these fields exceeds that of any other country. Except in a few isolated cases, however, the quality of the Soviet work continues to lag somewhat behind that of leading Western countries. The design and development of sophisticated instruments appears to be a weakness in almost all fields of terrestrial geophysics. This is particularly true in the area of geophysical prospecting, and Soviet efforts to obtain high-quality Western instruments have increased in recent years.

The Soviets maintain a very large research program in the fields of geomagnetism and geoelectricity. Their network of magnetotelluric stations is the world's largest, and they have expanded it in recent years to include several stations outside their territorial limits. The addition of these stations will provide the Soviets with important background data on the propagation of geomagnetic micropulsations for studying such areas as extremely low frequency (ELF) and very low frequency (VLF) propagation and for investigating ground-based methods for making magnetospheric plasma diagnostics. This network also could provide the Soviets with important data on magnetotelluric effects of nuclear detonations in the ionosphere should such tests be carried out in the future. The Soviet magnetotelluric research also might support the development of a hardened underground communications system in the future should they achieve the capability to drill to depths below 7 kilometers.

Soviet research in seismology is strong, and many of the investigations underway are applicable to detection of underground nuclear explosions, seismic engineering, or earthquake prediction. Although the Soviets maintain a seismic network for detecting underground nuclear explosions, their capability in this area probably is lower than that of the United States. Despite a rather large Soviet effort directed toward earthquake forecasting, the Soviets appear to be investigating conventional approaches, and there is no indication that they have progressed any farther than other countries in solving problems associated with earthquake forecasting. Seismic engineering studies in the U.S.S.R. received a strong impetus after the Tashkent earthquake of 1966, and the studies are of high quality. The Soviets have a larger number of seismic exploration crews searching for petroleum than any other country in the world, but the quality of

techniques and equipment lags behind that of the United States.

The Soviet research program in gravimetry also is hampered by inadequate instrumentation. Probably because of the instrumentation problem, the Soviet efforts in using gravity methods for mineral exploration have been less than those of the United States. They are attempting to develop improved gravimeters, however, and during the past few years have been increasing their efforts to collect gravity data, particularly at sea.

(5) *Geodesy*—The U.S.S.R. has an extensive and continually expanding research program in geodesy. Geodetic capabilities have grown considerably and are adequate to meet foreseeable economic and military demands. All civilian geodetic activities are conducted under the supervision of the Main Administration of Geodesy and Cartography (GUGK), which controls the major geodetic research institutes, research centers, and local aerogeodetic enterprises; it schedules all geodetic control and mapping projects, with the exception of migrational boundary areas, certain strategic areas within the country, and foreign mapping. These exceptions are the responsibility of the Military Topographic Administration (VTU), whose activities are highly classified. Active research programs are underway in geodetic surveying, triangulation, leveling, astronomic determinations, gravimetric and magnetic observations, spatial triangulation, and the construction of necessary technical equipment.

The goals of the Soviet geodetic effort are: to extend the astrogeodetic and unified coordinate system through the country; to resolve differences between the Soviet datum and recently adjusted Western European datum; to establish firm connections with the North American datum; and ultimately to establish a world geodetic system. The accomplishment of these goals is within Soviet capabilities, particularly since the U.S.-derived satellite geodetic data is available to them through international organizations. Because the Soviets classify all gravity data for the U.S.S.R. and European Communist countries and the United States openly publishes most of its gravity data, the Soviets enjoy an advantage in the reduction of geodetic error contribution to the miss-distance of future ICBM systems and probably will reduce these errors with less difficulty than will the United States. Soviet accomplishments in geodesy include construction of a first-order triangulation net consisting of over 500 loops covering more than 100,000 kilometers (62,137 miles) and integration of the geodetic nets of European Communist countries.

The Soviets have considerable interest in satellite geodesy but are not known to have launched an earth satellite specifically for geodetic purposes. They do not have a worldwide tracking system to support a satellite geodetic program but have initiated covert placement of extraterritorial tracking sites in certain countries and have placed them openly in other countries. Although the small number of such sites presently limits Soviet

capabilities in satellite geodesy, they are assisted by U.S.-derived geodetic satellite data acquired through international organizations.

(6) *Hydrology, hydraulics, and coastal engineering*—The U.S.S.R. ranks second to the United States in hydrological and hydraulic research. Most of the effort is directed to problems in three broad areas—electric power, inland waterways, and irrigation. Hydrologic research is focused on problems of river regimes, ice phenomena on large rivers and reservoirs, evaporation, seasonal variations of river discharge and runoff, protection measures against flash floods and mud-and-debris flows, hydrothermal characteristics of permafrost and frozen soil, and extension of the test-wells network for ground-water studies.

Hydraulic research is concerned with three-dimensional electrical modeling of seepage flow, unsteady regime in downstream pool, superturbulent flow and rolling waves movement, routing of floods, aerated flow in open spillways and pressure pipes, hydraulic resistance effecting head losses, and initiating new techniques for hydraulic construction in regions with subzero temperatures, such as the application of hydrofoam insulators in concrete work. Computers are used in studying discharge rating curves, plotting critical flood waves, programing reservoir volume, and estimating seasonal variation and control of reservoir balances. Several high-quality instruments such as remote-control recorders, neutronic moisture tracers, gamma ray densimeters, and underwater TV cameras have been developed.

Soviet hydrologists and hydraulic engineers, some world-renowned, are very active in national and international professional organizations. Several have been chosen as members of various working groups for the International Hydrological Decade (1965-74) of the International Association of Scientific Hydrology (IASH), under the auspices of the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

The U.S.S.R. ranks second to the United States as a world leader in coastal engineering research. New study techniques and equipment that will facilitate exploration of shallow-water mineral deposits have been developed. Also, new research techniques and equipment have been developed to assist in the study of littoral drift and sedimentation effects. These studies will help to determine the type and placement of protective structures needed to prevent erosion of coast and beach areas and silting of ports and harbors, especially in the Black Sea and the Baltic Sea. In marine dynamics and protective works, emphasis has been placed on the origin and occurrence of storms and their effects on coastal and protective structures. Special emphasis has been given to the development and use of continuous-printing current meters to record storm currents and the dynamics of waters in the coastal zone of the Baltic Sea. Since 1968 increased attention has been given to the study of North Pacific Ocean storms

and the origin and occurrence of tsunami waves resulting from earthquakes in the Pacific Ocean basin.

Coastal research and engineering programs in the fields of marine dynamics, shore processes, protective works, and instrumentation are carried out by approximately 40 Soviet organizations and establishments. The leading researcher, V. P. Zenkovich, heads the Laboratory of Dynamics and Morphology of Shores, an element of the Institute of Oceanology in Moscow under the U.S.S.R. Academy of Sciences. The Soviet Union is placing greater emphasis on the study of seas and coasts and plans to increase research and engineering efforts in these fields. Recent Soviet studies, especially of shallow coastal waters, have achieved international recognition. Soviet scientists participate fully at international meetings and conferences on coastal research and exert a great influence on research conducted by the Eastern European countries.

(7) *Oceanography*—The U.S.S.R. is a leading country in oceanographic research, ranking behind the United States but ahead of the United Kingdom and Japan. The Soviets stress those aspects of oceanography which have economic and military applications, while fundamental oceanographic research is weak. The concentrated effort on applied research has increased significantly the Soviet naval warfare potential, especially in support of undersea warfare.

The Soviets are making a significant thrust in understanding oceanic ecology. They are particularly active in food protein technology, and much of the oceanographic effort supports the marine fisheries industry. A significant amount of the research, however, is applicable to the Soviet undersea detection program. For more than two decades the Soviets have been studying the role that marine plankton, fish, and mammals play in undersea communication and antisubmarine warfare. Research has been expanded on the sound scattering layer, fish detection, bioluminescence, and hydroacoustic devices, and considerable effort is devoted to the telemetry and hydrodynamics of the dolphin. Much of the research on dynamic oceanography probably is directed toward support of naval operations, particularly mine, submarine, and antisubmarine warfare. The U.S.S.R. has had a strong program in hydrooptics since 1960 and is well advanced in the development of underwater optical instruments.

The Soviets are leaders in deep oceanography and conduct deep-sea surveying operations in all the oceans, with emphasis on detailed investigations of small oceanic areas. Approximately eight oceanographic research ships, some of which replace ships being retired, are being added to the fleet each year to carry out this program. Surveys of coastal waters for minerals has been retarded by the lack of accurate navigational positioning oceanographic stations. Soviet oceanographers have shown little leadership in ocean wave research but are outstanding in turbulence studies. The Soviet Union excels in polar oceanography and is doing excellent research in ice and ice forecasting. It has

increased its support of scientific programs conducted from drifting stations in the Arctic Ocean, and 15 to 20 drifting automatic radiometeorological stations under the direction of GUGMS are in operation in the Arctic area.

There are weaknesses in the oceanographic program. Progress is limited by the slow development of sophisticated electronic instrumentation; most of the Soviet oceanographic instruments are crude prototype devices that lack calibration and testing. Oceanographers lack ingenuity and are weak in their interpretation of data obtained at sea, despite an increasing use of computers in their data collection program. The Soviet Union is far behind the United States in the development and operation of deep submergence research vehicles, although slight progress has been made. Similarly, the Soviets lag the United States in the technology of underwater habitats. Oceanographic research also is hampered by an inflexible organizational structure and crowded working conditions for researchers.

Two organizations coordinate oceanographic research: the Interdepartmental Committee for Oceanography, which is subordinate to the GKNT, and the National Oceanographic Committee of the Earth Sciences Section of the U.S.S.R. Academy of Sciences. The former coordinates applied oceanographic research, while the latter coordinates most of the fundamental research carried out by the universities and institutes. Despite these organizations, a lack of coordination reportedly exists in the oceanographic programs. The most important organizations responsible for oceanographic research are the Institute of Oceanology, Moscow, and the Marine Hydrophysics Institute, Sevastopol', both of the U.S.S.R. Academy of Sciences; the Hydrographic Service of the Navy,

Leningrad; GUGMS; and the All-Union Scientific Research Institute for Marine Fisheries and Oceanography (VNIRO), Moscow, under the Ministry of the Fishing Industry.

A new Laboratory of Aero-Oceanography has been established at the Leningrad branch of the Institute of Oceanology to investigate the possibilities of space oceanography. Also, the Institute of Marine Biology under the Far Eastern Department of the Siberian Branch of the U.S.S.R. Academy of Sciences was established in 1968 at Vladivostok.

The U.S.S.R. participates in international marine science activities. It is a member of all prominent oceanographic organizations and has participated in numerous multinational cooperative survey programs. In 1970 Soviet ships and personnel, in cooperation with oceanographers from the United Kingdom, Canada, West Germany, East Germany, and the United States, collected data on currents in the southeast North Atlantic Ocean at various depths from 25 meters to 1,200 meters. During this survey, they tested and evaluated current meters from various countries, arranged in a massive buoy array. The Soviet Union is planning an international research program entitled "The Project for International Research in the Mediterranean." It also is very interested in cooperating with other countries, particularly the United States, in developing an international ocean buoy data system. Soviet oceanographers are compiling a General Bathymetric Chart of the Oceans as part of a program instituted by the International Hydrographic Bureau. Prof. A. S. Monin, director of the Institute of Oceanology in Moscow, is the Soviet member and a vice president of the Scientific Committee on Oceanic Research (SCOR) of the International Council of Scientific Unions.

8. Armed Forces

A. General

The Soviet Armed Forces, as presently constituted, consist of ground, naval, air, air defense, and rocket forces. The main purpose of each of these is to develop combat forces along functional lines for coordinated operations; all five components are highly interdependent. (C)

The personnel strength of the armed forces is estimated at about 3.5 million men. Personnel assigned to the ground forces represent almost two-thirds of the total military manpower—approximately 2 million, including about 349,000 assigned to ground elements of the strategic defense forces. Of this total, about 1,410,000 constitute the general-purpose ground forces. Approximately 410,000 personnel are assigned to ground forces command and general support. The remainder of the military personnel are believed assigned as follows: navy, 474,000 (including 402,000 in general-purpose naval forces, 8,000 in strategic attack forces, and 64,000 in navy command and general support); air forces, 510,000 (including 225,000 in general-purpose air forces, 133,000 in strategic defense forces, 58,000 in strategic attack forces, and 94,000 in air forces command and general support); strategic rocket forces, 375,500 (including 300,500 in strategic attack forces and 75,000 in rocket forces command and general support). In addition, the border and internal troops of the security forces have a personnel strength of about 250,000. (S)

The main units of the general-purpose ground forces include 20 armies, 14 corps, 161 line divisions (motorized rifle, tank, and airborne), and 9 artillery divisions. Major naval surface combatants total over 210, and submarines number about 350. In addition, there are over 2,200 other surface combatants and auxiliaries. There are over 970 combat and reconnaissance aircraft in naval aviation. The long-range air force has approximately 910 bombers and tankers, while tactical aviation is made up of some 4,000 fighters and light bombers. About 3,200 fighters are assigned to the air defense forces. An estimated operational inventory of approximately 1,475 intercontinental ballistic missile launchers (over 1,600 missiles) and more than 700 variable-,²² intermediate-, and medium-range missile launchers (nearly 1,200 missiles) are in the hands of the strategic rocket forces. (S)

²²The 120 variable-range SS-11's are equally capable of use as ICBM's.

In addition to the strength of its own armed forces, the Soviet leadership regards the military capabilities of the other Warsaw Pact states as an important element in the strategic position of the U.S.S.R. Other Warsaw Pact forces help maintain Soviet hegemony in these countries; increase Soviet war potential; and, with groups of Soviet forces in the area, provide a forward line of defense against NATO forces. Since the mid-1950's the Soviet Union has increased the other Warsaw Pact countries' capabilities for independent military action by providing them with modern equipment and giving them greater control over their own forces than they enjoyed in the past. The Warsaw Pact organization, however, is the structure for organizational and command control of these forces; in wartime the Soviet high command would exercise ultimate control. (C)

1. Historical

25X1

The Soviet Armed Forces date officially from 1918. After the civil war, in which the Soviet regime defended itself against internal and foreign opposition, development of the armed forces was influenced by two major factors. The first was a series of reforms, including the establishment of military schools and academies, reorganization of the military establishment along territorial lines, and the assignment of more responsibility to tactical commanders. These reforms, which laid the groundwork for a modern military establishment, were carried out by Mikhail V. Frunze, Trotsky's successor as People's Commissar of Defense. The second factor was rapid industrialization of the U.S.S.R., which began in the early 1930's and enabled the Soviet Union to reequip its forces with modern weapons and materiel.

The modernized armed forces faced their first test in Manchuria with the successful frontier engagements against the Japanese in 1938 and 1939. In the attack on Finland in late 1939, poorly trained Soviet troops suffered a series of humiliating defeats. Early in 1940, however, Finnish resistance was crushed by Soviet units well trained in winter warfare.

World War II represents to the U.S.S.R. its greatest military triumph. Despite initial defeats which caused severe losses in men and materiel, its forces held against the German offensive in 1941 and launched a counteroffensive in the winter of 1942. The Nazis were gradually repulsed, and in January 1945 the U.S.S.R. unleashed the final offensive which opened the way to Berlin.

Since the end of World War II, the U.S.S.R. has made a sustained effort to modernize its armed forces. The ground forces, though reduced in number, have been reequipped on a scale exceeding that of any other land force in the world, with a wide variety of modern weapons and equipment ranging from small arms to tanks and guided missiles. Notable advances have been made in mechanization, communications, and the development of amphibious equipment. Reorganization and development have resulted in a marked increase in the mobility and firepower of the ground forces.

In the 1945-54 period, the U.S.S.R. devoted considerable effort also to a quantitative rebuilding of its naval forces, both surface ships and submarines. During this period, units such as the SKORYY class destroyer, RICA class destroyer escort, and W class submarine were built in large numbers. In the 1956-65 period the Soviets responded to the growing technological threat posed by Western forces—e.g., Polaris missile-launching nuclear submarines—by emphasizing qualitative improvement of naval hardware and by producing cruise missile-launching surface ships and submarines, surface-to-air missile-configured surface ships, new-generation electronics for combatants, and an advanced gas turbine propulsion plant for surface ships. The late 1960's continued to reflect Soviet interest in the qualitative improvement of naval weapon systems and ships. New technology in shipbuilding permitted the U.S.S.R. to produce ships on a wartime-type schedule while adding new electronics and weaponry. In 1968, three new classes of surface ships and five new classes of submarines were introduced. The Soviets probably will continue to build advanced-design submarines and missile-equipped surface ships in considerable numbers until older ships and submarines can be deactivated or scrapped.

The air forces have created a formidable offensive-defensive capability. Competent strategic bomber, tactical air, and defensive air forces have been trained. Among the most significant developments in the air forces since 1960 have been the introduction of new equipment, including a new medium bomber, a new light bomber, air warning and control aircraft, and new fighters and transports; more widespread use of air-to-surface missiles; and additional in-flight refueling capabilities for heavy bombers.

The air defense forces, which occupy an equal organizational level with ground, naval, air, and rocket components, are continuing to undergo transition. Significantly improved capability has resulted from rapid deployment of surface-to-air missiles (SAM) and the introduction of improved electronic devices and armament in both interceptors and ground equipment.

The Strategic Rocket Troops, established in 1960 and placed on an equal organizational level with the other force components, constitute the main strategic force of the U.S.S.R. The development of strategic surface-to-surface missiles (SSM) and their introduction into operational inventories provide the Soviets with an intercontinental strike capability which can be

employed with minimum warning. Within the next few years strategic missiles probably will account for an increasing portion of Soviet nuclear offensive capability.

2. Defense organization

25X1

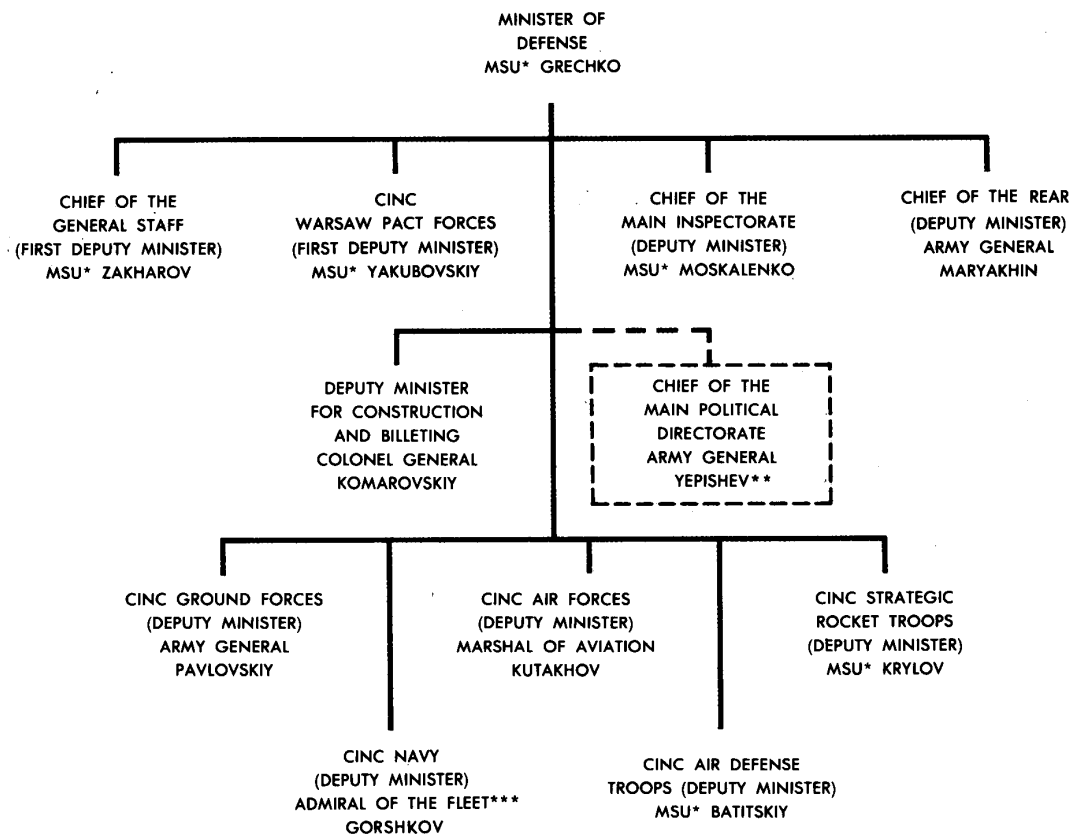
The Soviet Armed Forces are controlled by the Ministry of Defense, headed by a minister who is normally a military officer on active duty. The Minister of Defense is a member of the Council of Ministers within the Soviet Government and is responsible to the Central Committee of the Communist Party of the Soviet Union. The minister advises the Council of Ministers and the Party Central Committee on the requirements and capabilities of the armed forces and is responsible for implementing decisions of the political leaders. Operational command and overall administrative control of the armed forces are exercised by the Minister of Defense through the high command (Figure 139).

The Supreme Military Council, formed by Khrushchev and interposed between the Party Central Committee and the Ministry of Defense, was composed of key party and military personnel and it probably still exists. This council, in the past, was presided over by the civilian Supreme High Commander of the Soviet Armed Forces, usually the First Secretary of the Communist Party. It served as the highest organ for national defense policy and planning. Other military councils exist at major echelons of the military establishment from army or equivalent level up through the headquarters of the force components. These councils serve as advisory organs to the commander at each echelon.

The Soviet high command consists of the Minister of Defense and his deputies. At the present time there are three first deputy ministers, eight deputy ministers, and a political directorate. The political chief is not ranked as a deputy minister, possibly because he is also an official in the party secretariat, where he is subordinate to the General Secretary of the Communist Party.

There are several joint agencies of an administrative or technical nature within the Ministry of Defense which directly support the high command. Some of these agencies, such as the Main Personnel Directorate, are directly subordinate to the Minister of Defense; others, such as the Main Missile and Artillery Directorate, the Main Tank Directorate, the Central Motor Vehicle-Tractor Directorate, and the Central Finance Directorate, are subordinate to the various deputy ministers comprising the high command. The major elements of the Soviet high command and the major operational commands are shown in Figure 139.

The Soviet Armed Forces are divided into five force components—ground, navy, air, air defense, and rocket forces. Each is headed by a deputy minister of defense who is also commander in chief and the administrative head of his component. Operational control is the prerogative of the Minister of Defense, though he has apparently delegated varying degrees of operational control to force commanders.



*MARSHAL OF SOVIET UNION

**The exact relationship between General Yepishev and the Minister of Defense; and the Political Directorate and other elements of the high command is not completely clear. In some matters Yepishev is probably subordinate to Marshal Grechko. In many political matters he undoubtedly reports directly to the Party Central Committee.

***ADMIRAL OF THE FLEET OF THE SOVIET UNION

Note: There is a third First Deputy Minister (Army General Sokolov) whose functions are unknown. Since Army General Penkovskiy's death no incumbent has been identified with the position of Deputy Minister for Combat Training. Whether the position still exists is uncertain.

FIGURE 139. Armed forces high command

25X1

a. JOINT AGENCIES—The General Staff of the Soviet Armed Forces, headed by a Marshal of the Soviet Union, plans the coordinated development and employment of ground, naval, air, air defense, and rocket forces and issues directives to the major operational commands in the name of the Minister of Defense. The general staff formulates the military program in peacetime and directly supervises its implementation in time of war. It is closely involved in the direction of combat operations in all theaters. The general staff includes directorates for operations,

intelligence, signal communications, organization and mobilization, military transportation, military topography, cryptography, military history, and others.

The Warsaw Pact, promulgated in 1955, establishes a combined command for Soviet and certain Eastern European Communist forces. The headquarters is in Moscow, and the Chief of the Warsaw Pact Forces is a Marshal of the Soviet Union.

The Chief of the Main Inspectorate, with a staff of senior officers, is responsible for evaluating the state of preparedness and the combat efficiency of the armed

forces. The inspectors make periodic visits to the major operational commands and present critiques on the state of combat readiness and other matters to the commanders concerned and to the appropriate agencies within the Ministry of Defense.

The Chief of the Rear is responsible for all logistic functions common to the armed forces and participates in the logistical aspects of high-level planning. He has control of service and supply functions common to all the services, including budget, pay, accounting, food, clothing, other quartermaster equipment, fuel and lubricants, medical and veterinary services, military transportation, and the direction of the activities of the Central Motor Vehicle-Tractor Directorate. These functions include research and development, procurement, storage, issue, and maintenance of common-use items. The Chief of the Rear also coordinates the various specialized procurement agencies (such as those for aviation, engineer, naval, ordnance, and signal equipment) which are either directly under the Minister of Defense or under the force components.

The Deputy Minister of Defense for Construction and Billeting coordinates the activities of specialized construction and quartering agencies at all echelons of the military establishment. Through his subordinate directorates he allocates materials, equipment, and personnel for construction activities and exercises policy control over the acquisition, provision, assignment, and repair of military housing as well as service and cultural facilities. He also coordinates the activities of military and nonmilitary construction agencies and authorizes the use of military construction troops for nonmilitary projects when necessary. The principal directorates within the Ministry of Defense directly subordinate to the Deputy Minister for Construction and Billeting are the Main Military Construction Directorate, the Billeting and Maintenance Directorate, and the Technical Directorate for Capital Construction.

The Chief of the Main Directorate of Military Training Establishments supervises and coordinates the overall military school systems, although specific control of service schools and academies (other than the Higher Military Academy of the General Staff) and their curriculums rests with the various force components and troop branches.

The Main Political Directorate of the Soviet Army and Navy is the principal instrument used by the Central Committee of the Communist Party to maintain political control over the armed forces, including rigid adherence to party policies and directives. The political apparatus is an integral part of all headquarters above company level throughout the military forces. It trains, administers, and directs the activities of the political officers responsible for political indoctrination of all personnel, morale-building programs, surveillance of political reliability, and the disciplinary and administrative control of members of the Communist Party and the Communist Youth League (Komsomol).

Other joint agencies within the Ministry of Defense which support the high command include the Main

Personnel Directorate, the Headquarters for Civil Defense, the Office of the Main Military Procurator, and the Military Publishing House. Another organization closely allied with the armed forces but not actually a part of the Ministry of Defense is the Voluntary Society for Cooperation with the Army, Aviation, and the Fleet (DOSAAF). Headed by the chairman of the Central Committee for DOSAAF, this nationwide organization provides specialist training of a military nature to young men of draft and predraft age. DOSAAF also assists in the civil defense training program.

There are three principal ordnance-type agencies which are not directly subordinate to the high command. These are the Main Missile and Artillery Directorate subordinate to the Commander of Missile and Artillery Troops of the Ground Forces, the Main Tank Directorate subordinate to the Chief of Tank Troops, and the Central Motor Vehicle-Tractor Directorate subordinate to the Chief of the Rear of the Soviet Armed Forces. These three agencies supervise research and development, determine design specifications of materiel, place orders with factories, accept items as they are produced, operate central depots, allocate and issue material to major operational commands, and control maintenance. For example, the Main Missile and Artillery Directorate deals with all types of weapons, including such varied items as aircraft armament, naval guns, small arms, and tactical missiles.

b. FORCE COMPONENTS—The commanders in chief of ground, naval, air, air defense, and rocket forces are generally concerned with organization, doctrine, manning, training, administration, and logistic requirements for their respective arms. Each commander in chief has a main staff, corresponding to the General Staff of the Soviet Armed Forces, and counterparts of the various directorates of the Ministry of Defense to formulate policies and adapt instructions from above to their respective arms. Their participation in the operational command of troops is limited by varying degrees of command authority retained by the Minister of Defense. The minister has delegated operational control to the Commander in Chief of Air Defense and probably, in large measure, to the Commander in Chief of the Strategic Rocket Troops because of the quick reaction time required of their missions. The Commander in Chief of the Navy has a degree of operational control over naval forces because of the specialized nature of such operations. The Commander in Chief of the Soviet Air Forces, as a deputy minister, probably advises and assists the Minister of Defense in the operational control of the several air forces, and for air matters he possibly is in the line of control to commanders of the military districts and groups of forces. The position of commander in chief and the headquarters and main staff of the ground forces, abolished in 1964, were

reestablished late in 1967. Whether the Commander in Chief of the Ground Forces exercises operational control in any degree is as yet unknown.

According to Soviet military concepts, all five force components would be employed in a coordinated effort in wartime. Operationally, forces prepared for combat by functional components of the Soviet Armed Forces are organized into major commands which are controlled directly by the Minister of Defense. Administratively, the force components depend heavily for funding, logistic, and personnel support on high command agencies such as the Main Personnel Directorate, the Chief of the Rear, the various main directorates for armament, and the numerous other administrative and technical agencies directed by the Minister of Defense.

c. OPERATIONAL COMMANDS—The principal operational commands outside the high command are military districts and groups of forces, naval fleets and flotillas, long-range aviation, military transport aviation, air defense districts, and strategic rocket forces.

The majority of land-based forces are organized into military districts and groups of forces, whose command apparatus can have a relatively flexible span of control, including operations of major line units, combat and service support units, and tactical air elements. Similarly, in the major naval commands the fleet headquarters for command of forces afloat also controls a supporting shore establishment, encompassing coastal defense forces and land-based fleet air forces. The remaining operational commands have more specialized missions as indicated by their designations.

The Commander in Chief of Air Defense Troops serves as a channel of operational control. Similarly, the Commander of Long Range Aviation in Moscow, although administratively subordinate to the Commander in Chief of the Soviet Air Forces, is believed to serve as an operational channel between the ministry and the long-range air armies. Essentially this is also true for the Commander of Military Transport Aviation. The same type of channel, furnished by the Commander in Chief of the Strategic Rocket Troops, may link the ministry with strategic rocket units in the field. Airborne units are believed to comprise a separate operational command only so long as they are held as a reserve of the high command. When assigned to military districts or groups of forces, operational control of airborne units passes to the commander of the force to which they are assigned.

d. MILITARIZED SECURITY FORCES—In addition to its regular land, sea, and air forces, the Soviet Union has approximately 250,000 militarized security personnel (frontier troops and interior troops) who are organized into military units to guard the borders, maintain domestic security, and guard important establishments, persons, and shipments. Some 175,000 Soviet Frontier Troops of the Committee for State Security (KGB) are responsible for securing the land and sea frontiers of the

U.S.S.R. The Main Directorate of Frontier Troops of the KGB, in Moscow, exercises general supervision and control over the frontier districts. Also under KGB control are special signal troops who are responsible for the installation, maintenance, and security of communication facilities (telephone and telegraph) between Moscow and high-level military headquarters, such as military district and group of forces headquarters.

The Soviet Interior Troops, consisting of internal security forces and convoy troops, and numbering 75,000, are subordinate to the ministries for maintenance of public order of the constituent republics in which they are located. Internal security troops are combat-type units responsible for suppressing dissident and subversive elements, quelling revolts and strikes, and controlling the civil populace in the event of disaster. Convoy troops are responsible for guarding deportees, shipments of strategic materials, and prisoners en route between prisons and labor camps.

3. Military manpower

25X1

There were approximately 60,470,000 males between the ages of 15 and 49 as of 1 January 1971. Shown as follows, about 80% were considered fit for military service:

AGE	TOTAL MALES	FIT FOR MILITARY SERVICE
15-19	11,453,000	10,755,000
20-24	9,565,000	8,485,000
25-29	6,107,000	4,950,000
30-34	10,530,000	8,350,000
35-39	8,416,000	6,390,000
40-44	8,623,000	5,785,000
45-49	5,776,000	3,495,000
Total	60,470,000	48,210,000

The average number of males who will reach military registration age (17) annually, 1971 through 1975, is about 2,352,000. The annual draft contingent is about 1 million and is expected to remain constant for the near future. The manpower pool is sufficient to meet the demands of the armed forces and is adequate to support essential defense industries in an all-out war effort. Particularly notable is the fact that even in time of peace the economy relies heavily on work performed by women in sections of the economy in which female labor is not typically employed in most other countries.

The quality of military manpower, particularly of the Russian element, is generally good. The previous low educational levels have been substantially raised, particularly in the technical fields. The high quality of training in military service also tends to increase technical proficiency. Typical of most military personnel is their willingness and ability to endure hardships. The armed forces are loyal to the regime, and morale is considered to be high, especially in certain elite groups such as paratroopers, pilots, strategic rocket troopers, and submariners.

Conditions of service are generally good. During World War II and the postwar era, the pay and privileges of officers have placed them in the same category as engineers, party dignitaries, and other favorites of the state. To a lesser extent, the enlisted personnel on extended service also enjoy a higher prestige and status in the armed forces than they might attain in civilian life. Individuals may improve their professional knowledge and skills, but advancement is largely contingent upon active participation in party programs. It is estimated that 82% of armed forces personnel are party or Komsomol members.

The military personnel procurement system is based on the Universal Military Service Law of 1967, which provides for mandatory conscription of enlisted personnel for the military establishment. Under this law a new conscript class (age group) is called up for service each year in equal semiannual increments (during May and June and during November and December) as an older class is released. Enlisted conscripts complete terms of 2 years in the ground and air forces and 3 years in the navy. Inductees with a higher education are required to serve only 1 year regardless of branch of the armed forces; this applies also to frontier and security troops. Professional enlisted men or extended-service personnel are procured on a voluntary basis. The extended-reenlistment service noncommissioned officer or specialist, having completed mandatory conscript training, reenlists every 2 years until he has been on extended service for 10 years, at which time he is considered to be on an indefinite enlistment.

Officers enter active commissioned service in several ways. Most are obtained through graduation from one of the various officer candidate schools maintained by each arm or service. Officers are also obtained for active duty service by callup from the reserve. Reserve commissions can be acquired either directly from civilian life, through participation in an ROTC-type program in institutions of higher education, or, in the case of enlisted personnel with a higher education, by passing the prescribed examination upon completion of their mandatory tours of active duty. It is also possible to be commissioned directly from civilian life and placed immediately on active duty. Three distinct groups enter OCS: graduates of Suvorov cadet schools, young men who apply directly from civilian status, and noncommissioned officers on active duty who seek careers as officers. Officers serve at the convenience of the government rather than for specified periods. Officers can be called up from the reserves on a voluntary basis or by conscription for 2- to 3-year periods in the case of officers under 30 years of age. Of approximately 3.5 million officers and enlisted men in the armed forces, approximately 75% are enlisted conscripts, 10% are extended service personnel, and 15% are officers.

The standards of physical fitness for service in peacetime are revised frequently depending on the number of men required for a given year as compared with the number available and the physical conditions

of the men in the recruitment age group. Potential conscripts can receive permanent exemptions or temporary deferments from military service. Between 5% and 10% of a given class is usually determined to be physically unfit for peacetime military service. Exemptions are given to those having family hardship cases, and deferments are granted to those attending institutions of higher learning.

The Soviet Union, through the application of its Universal Military Service Law, has developed an effective reserve system. The law provides for two categories of reservists. Category I consists of all men who have served on active duty not less than 1 year in the armed forces. Category II reservists are those who have served less than 1 year on active duty or who for various reasons were not called up for active duty. Reservists (ages 18 to 50) are estimated to number about 20 million—10 million each in Category I and Category II. Postservice training requirements are established by the Universal Military Service Law for both officer and enlisted Category I and Category II reservists. The frequency of callup for training and the duration of training periods varies according to age group within each category.

The *voyenkomat* or military commissariat system, existing at republic, *oblast*, and *rayon* administrative levels throughout the U.S.S.R., is an effective instrument for mobilization of manpower. The district military commissariat, at the base of the mobilization apparatus, makes mobilization assignments in accordance with specialist qualifications. The district military commissariat would be informed of general mobilization probably within 2 or 3 hours following the decision to mobilize. Couriers would be sent out immediately to notify reserve personnel being called up in the first stage of mobilization. Insofar as possible, reservists are assigned to units located near their homes. About 1.75 million reservists would be required to bring the existing ground forces up to wartime strength. This could be accomplished within a very short time using only Category I reservists who have completed active duty tours within the past 5 years. By utilizing all remaining Category I as well as Category II reservists, several hundred additional divisions could be formed. However, the time required to equip these divisions would depend entirely on production capacity since there is no evidence of mobilization equipment stocks currently available to supply more than the existing ground forces units.

4. Strength trends

Trends in the number of men under arms are shown in Figure 140. Included are estimated levels of uniformed personnel during each of several significant years since 1945 in the ground, naval, air, and rocket forces, the regular military establishment as a whole, and the militarized security forces represented by frontier and interior troops of various state security agencies.

25X1

FIGURE 140. PERSONNEL STRENGTHS OF THE ARMED FORCES
(Thousands)

DATE	GROUND FORCES	NAVAL FORCES	AIR FORCES	STRATEGIC	ESTIMATED TOTALS	SECURITY FORCES
				ROCKET TROOPS		
World War II peak (May 1945)*.....	10,000	600	1,000	.....	11,600	700
January 1946.....	5,000	695	705	.....	6,400	600
January 1947.....	2,800	695	555	.....	4,050	500
January 1948.....	2,600	695	505	.....	3,800	400
January 1950.....	2,650	695	555	.....	3,900	400
January 1951.....	3,400	695	605	.....	4,700	400
January 1953.....	3,400	745	655	.....	4,800	400
January 1955.....	3,000	795	705	.....	4,500	na
January 1958.....	2,700	660	640	.....	4,000	300
January 1960.....	2,500	560	590	.....	3,650	250
January 1961.....	2,200	480	535	.....	3,215	250
January 1963.....	2,000	505	540	185	3,230	225
January 1965.....	1,700	450	510	200	2,860	225
January 1967.....	1,950	455	500	230	3,135	225
January 1968.....	2,035	465	500	325	3,325	225
January 1969.....	2,200	472	477	336	3,485	225
January 1970.....	2,149	474	510	339	3,472	225
July 1970.....	2,139	474	510	375	3,498	250

*For this year only, naval air personnel included in air forces strength.

Motivated by political, economic, and strategic considerations, Khrushchev in early 1960 announced his plan to reduce total military manpower. By early 1961 the Soviet forces had been reduced to approximately 3.2 million. Here reductions stopped temporarily; actually the impulse of the Berlin crisis, followed the next year by the Cuban confrontation, caused temporary increases. The downward trend was resumed in late 1962. During the next 3 years the air defense forces and strategic missile forces were expanded, while decreases took place in the theater field forces. It is estimated that the armed forces strength is about 3.5 million men.

5. Training

The generally high quality of the military forces results in large measure from the coordinated training of all components. Ground, naval, and air elements are provided with good training facilities and are almost continually engaged in individual training and unit field exercises, culminating in frequent joint activity. Most common are ground-air and sea-air exercises, with cooperation among all three types of forces limited generally to air defense and occasional amphibious exercises.

Under the Universal Military Service Law all youths must receive introductory military training prior to callup for active service. This training is to be conducted at general-education schools beginning in the ninth grade, in specialized secondary educational institutions, and in technical vocational schools. Instructors are to be military personnel. Young boys not in school are to receive introductory military training at training centers set up at factories, institutions, and organizations, and on collective farms.

For training of specialists and reservists, the Soviet Union relies heavily on the joint semimilitary

organization DOSAAF. DOSAAF activities, strongly supplemented by propaganda, promote popular support for the armed forces, especially through the various programs conducted for youth. The curriculums include extensive studies in military science as well as training in marksmanship, vehicle driving and maintenance, communication techniques, and many other areas, which help to produce a large reservoir of trained and semitrained personnel available to the armed forces. The clubs of DOSAAF also provide annual proficiency tests for reservists.

The armed forces conduct well-organized and effective officer training programs through a network of branch and higher level schools, where personnel are thoroughly educated in political and military subjects. Although centrally coordinated, the majority of military schools are organized and administered by the individual branches, with relatively few institutions devoted to the training of all arms and services. A notable exception to this division in military education is the Higher Military Academy of the General Staff of the Armed Forces of the U.S.S.R. (formerly known as the Voroshilov Higher Military Academy). This is the highest level military institution, and it is attended by high-ranking officers of all branches of the armed forces. Interarm cooperation is taught at the other military educational establishments, but as a subsidiary aspect of branch training.

Officers of foreign military forces are trained in Soviet military schools. The majority of such personnel represent foreign Communist states, particularly those of Eastern Europe, although nonaligned states such as Indonesia are also represented.

Inasmuch as Soviet Tactical Aviation is assigned to military districts and groups of forces, field training for land warfare includes extensive activity featuring joint

ground-air operations. Ground forces offensive and defensive missions in all large-scale exercises and maneuvers are supported by fighter and bomber aircraft of tactical air armies. Moreover, as evidenced by observation of the Soviet forces in East Germany, the yearly training cycles of both tactical air and ground forces closely coincide. This correlation of training programs also prevails within the U.S.S.R., and at times other components of the air forces are employed to support tactical components.

Joint training is considered at least as important in the navy as in the ground forces. The naval fleets each have organic fleet air forces of land-based bomber, mine-torpedo, reconnaissance, and transport aircraft, as well as helicopters. Cooperation is regularly practiced between this shore-based naval aviation and the surface and submarine units afloat.

The operational training of airborne and air defense forces always involves closely coordinated activity. In both cases, surface and air elements are organized with the aim of insuring and increasing the efficiency of joint operations. Airborne elements conduct field training with their assigned transport aviation, including fixed- and rotary-wing units. Air defense forces, in concert with elements of the ground and tactical air armies in the field, regularly engage in practice alerts in which anti-aircraft ground forces units, surface-to-air missile units, and fighter aircraft act together in defense against simulated enemy attack. Naval surface units also cooperate with air defense forces, conducting early warning and intercept operations over water, ports, and naval shore installations.

Despite its limited and unsatisfactory war experience in amphibious operations, the U.S.S.R. is showing renewed interest in this form of offensive action in training programs, particularly since the reactivation of the naval infantry in all four fleets. Evidence suggests there are only small numbers of exercises and maneuvers to train ground, naval, and air components in joint amphibious assaults. However, the amphibious training program apparently is current and well developed, including, for example, simulated atomic play.

6. Economic support and military budget

a. ECONOMIC SUPPORT—The strength of the economy is a key element of Soviet military power, with the defense establishment enjoying a high priority in the allocation of resources. The U.S.S.R., with the world's second largest industrial base, is virtually self-sufficient in food, industrial raw materials, and fuels. There is relatively little dependence on foreign trade. Economic growth of about 5% to 6% annually enables the U.S.S.R. to increase its military programs at a similar rate.

The ground forces materiel industry produces large quantities of weapons and equipment for Soviet forces as well as the bulk of materiel for the other Warsaw Pact countries. Of the complexes producing ground forces weapons, some 16 sizable plants are at least partially

engaged in producing armored personnel carriers, armored tracked prime movers, artillery, infantry weapons, and tanks. Of these plants, three are final assembly plants for tanks, four for armored personnel carriers, and nine for the manufacture of artillery and infantry weapons. Ammunition production facilities are extensive; 37 final assemblers are supported by numerous plants making components, explosives, and propellants. About 50 plants in the large electronic/telecommunication industry produce the bulk of military wire, radio, radar, and other electronic equipment. Military output, ranging from simple components to highly complex devices, accounts for nearly 75% of total domestic electronics production. The motor vehicle industry has nine major plants producing vehicles used by the military. Other segments of industry provide the chemical, engineer, medical, and quartermaster equipment and supplies required by the armed forces. Most of these plants are dual-purpose facilities, manufacturing both military items and consumer goods, and constitute a large industrial mobilization base. In case of war, the U.S.S.R. would be capable of meeting its own requirements for ground forces weapons and equipment and, in addition, could supply substantial quantities of materiel to other members of the Warsaw Pact.

Soviet naval shipyards, especially those building submarines, are among the most modern and versatile in the world in terms of facilities and production techniques. A variety of major combatants are produced domestically, with submarines receiving priority. Foreign sources, mainly Polish shipyards, supply a limited number of repair, intelligence collection, and hydrographic survey auxiliaries as well as the POLNOCHNY class medium landing ship. The U.S.S.R. could substantially increase shipbuilding and maintenance activities—both naval and merchant—in the event of mobilization. Current naval ship construction programs include: six classes of submarines, at least four of which are nuclear powered; sophisticated cruisers and destroyers with increased antisubmarine warfare, anti-air warfare, and extended-range cruising capabilities; escorts, submarine chasers, and guided missile patrol boats with improved capabilities; amphibious and mine warfare ships; as well as modern support auxiliaries to service the large submarine force.

The aircraft industry, second in size only to that of the United States, is capable of producing aircraft of all types and complexities. It is a high-priority industry which claims a large investment in production and research facilities and employs a significant share of the country's engineering and technical personnel. The industry not only fulfills military and civilian requirements for aircraft but also provides military and transport aircraft for sale abroad to Communist and non-Communist countries. Most airframe and engine plants have some capacity for the manufacture of consumer goods, production of which helps provide stable employment for labor in an industry noted for

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wide fluctuations in output. The facilities are believed to be sufficiently balanced so that engines and components would be available to support a maximum production effort in the airframe plants. In general, the industry makes use of a fairly narrow range of off-the-shelf engine types to power its military and civil aircraft. The industry is striving for and attaining improved quality in the aircraft being produced. A supersonic transport is being flight-tested; a new variable geometry bomber prototype is believed to be in the flight-test stage; some BEAR variants are being produced; and a Mach-3 fighter is in series production. Soviet production of aircraft since World War II has been characterized by a decline in numbers and a substantial increase in airframe weight. The newer aircraft have improved capabilities, greater efficiency, and longer service life. As a matter of policy, the U.S.S.R. satisfies many of its light aircraft needs by imports from other Warsaw Pact countries.

The missile and space equipment industry has sufficient resources and production capacity to support all the needs of the armed forces, both in peacetime and in the event of mobilization. The industry is able to supply the Warsaw Pact nations with defensive and tactical weapons and also exports missiles to several non-Communist, but politically friendly, nations. The industry is virtually self-sufficient, although the U.S.S.R. does contract some component production to the other Warsaw Pact countries.

b. **MILITARY BUDGET**—The military budget is prepared by the Minister of Defense in coordination with the Chairman of the State Planning Committee and the Chairman of the Military Industrial Committee. It is included in the state budget for review by the Council of Ministers. The Council of Ministers then presents the state budget to the Supreme Soviet for approval. The announced defense budget does not include all defense expenditures of the Soviet Union. Additional defense funds, mainly research and development, are carried in other budget categories.

The announced and estimated total defense and space expenditures for the years 1966 through 1970 are shown in Figure 141. The estimated dollar equivalents

FIGURE 141. DEFENSE AND SPACE
EXPENDITURES
(Billions of 1968 dollars)

	1966	1967	1968	1969	1970
Announced defense budget (rubles).....	13.4	14.5	16.7	17.7	17.9
Estimated defense and space expenditures (constant value rubles).....	18.7	19.9	20.6	21.6	22.2
Estimated defense and space expenditures as a percentage of GNP (ruble basis).....	8.0	8.0	8.0	8.0	7.0
Estimated dollar equivalents of defense and space expenditures (1968 dollars)*.....	56.9	60.1	62.5	65.0	66.5

*What it would cost to purchase these defense packages in the United States.

of military and space expenditures by major mission are shown in Figure 142. The estimated percentage distribution of military and space expenditures by mission on a ruble basis is shown in Figure 143. The estimated defense and space expenditures by category are shown in Figure 144.

7. Logistics

The Chief of the Rear, who is a Deputy Minister of Defense, either directly controls or coordinates all logistic functions in the armed forces. His staff is one of the principal armed force policy staffs and is directly subordinate to the Minister of Defense. Subordinate rear service directorates and departments are found in

FIGURE 142. ESTIMATED DEFENSE AND SPACE
EXPENDITURES
(Billions of 1968 dollars)

MISSION PROGRAM	1966	1967	1968	1969	1970
Strategic attack.....	5.9	6.6	6.8	7.0	6.9
Strategic defense.....	5.0	5.3	5.7	5.9	6.7
General purpose.....	17.6	18.0	18.3	18.9	18.8
Command and support*.....	16.7	17.4	18.1	18.1	18.3
Research, development, test, evaluation, and space.....	11.7	12.8	13.6	15.1	15.8
Total.....	56.9	60.1	62.5	65.0	66.5

*Includes all expenditures for nuclear weapons.

FIGURE 143. ESTIMATED PERCENTAGE
DISTRIBUTION OF DEFENSE AND
SPACE EXPENDITURES
(Calculated on a constant ruble basis)

MISSION PROGRAM	1966	1967	1968	1969	1970
Strategic attack.....	13	13	12	12	11
Strategic defense.....	9	9	10	10	10
General purpose.....	28	27	26	26	25
Command and support.....	21	21	21	20	20
Research, development, test, evaluation, and space.....	29	30	31	32	34
Total.....	100	100	100	100	100

FIGURE 144. ESTIMATED DEFENSE AND SPACE
EXPENDITURES BY CATEGORY
(Billions of 1968 dollars)

	1966	1967	1968	1969	1970
Investment expenditures:					
Procurement.....	11.1	12.2	12.4	12.5	12.7
Facilities.....	1.0	.9	.8	.8	.6
Subtotal.....	12.1	13.1	13.2	13.3	13.3
Operating expenditures:					
Personnel.....	20.7	21.3	22.2	22.5	22.9
Operating and maintenance..	13.0	13.4	14.0	14.6	15.0
Subtotal.....	33.7	34.7	36.2	37.1	37.9
Research, development, test, evaluation, and space.....	11.3	12.3	13.1	14.6	15.3
Total.....	57.1	60.1	62.5	65.0	66.5

the headquarters of the five force components and in all lower headquarters down to and including regiments.

The counterpart of the Chief of the Rear at subordinate echelons is called the deputy commander for the rear and is, in effect, commander of the rear area. At each level the deputy commander for the rear coordinates and/or supervises all logistic activities. He is responsible for the location of all installations and units within the rear area, and he supervises transportation and local security. Specific responsibilities of the deputy commander for the rear include procurement and supply of fuel, lubricants, food, and clothing; supervision of medical services, veterinary services, salvage, and military labor; transportation by road and supervision of road and rail maintenance; and finance and pay of all personnel. His functions apply not only to his own supply and service units, but to those of the various combat arms and services as well. At *front* level (the largest field command in wartime) the deputy commander for the rear supervises a number of services which perform functions of common support for the ground, naval, air, and rocket forces and also supports and coordinates their respective technical services.

Services and supplies other than the common-use items provided by the Chief of the Rear are normally furnished by the troop headquarters of the various arms and services. For example, engineer equipment is procured directly by the engineer troops, ships are procured by the naval forces, and aircraft by the air forces. Artillery and armored vehicle supply also are accomplished by the appropriate troop headquarters. Artillery supply, in the Soviet sense, includes all weapons and ammunition ranging from small arms up through the heaviest artillery, including tactical missiles, naval ordnance, and aircraft armament. Responsibility for the procurement of these items is centered in the Main Missile and Artillery Directorate of the Ministry of Defense. The procurement of armored vehicles is also handled within the Ministry of Defense by a technical directorate, the Main Tank Directorate. At lower echelons of command the supply of armored vehicles is the responsibility of the Chief of Tank Troops.

The procurement programs, as planned by the various arms and services and by the directorates within the staff of the Chief of the Rear, are consolidated by the Ministry of Defense and then coordinated with the various civilian ministries which are concerned with production. Military inspectors check production at factories and take over materiel upon completion. Equipment is stored in central storage depots in the interior of the country under the control of the Ministry of Defense or of military districts.

8. Uniforms and insignia

a. **UNIFORMS**—Soviet Armed Forces uniforms, other than the field uniform, may be grouped in three categories on the basis of general design: uniforms for marshals, generals, and admirals; uniforms for officers and career service noncommissioned officers; and

uniforms for other (conscript) enlisted personnel. Since the first Soviet regulations for the wearing of military uniforms were published in February 1926, many changes have taken place. On 26 July 1969 the U.S.S.R. Ministry of Defense announced new uniform regulations which introduced several new uniforms and uniform changes for members of the armed forces. The new uniforms, authorized for wear as of 1 January 1970, were to be phased in over a 2-year period while older uniforms are being worn out.

The pullover tunic was considered outmoded and unsuitable for wear under combat conditions. The parade-off duty, standing-collar dress coat also was considered uncomfortable for wear, particularly in hot weather. New and improved fabrics, such as synthetic materials, are to be used in the manufacture of military uniforms.

The new off-duty uniform for marshals and generals consists of a light-gray, double-breasted, open-collar coat; white shirt; black tie; and blue trousers.

Officers and career noncommissioned officers have been authorized a new parade-off duty uniform, which is blue-green for ground forces and blue for airborne troops and the air forces.

Conscript personnel, students at military schools of the ground forces, and military construction troops wear a new olive-drab, parade-off duty uniform consisting of a single-breasted, open-collar coat; olive-drab shirt and tie; and matching trousers. Branch of service colors are indicated on the shoulderboards: red for motorized rifle troops; black for artillery, engineer, and tank troops; and light-blue for airborne troops and personnel of the air forces.

The basic change to the service and field uniforms is the replacement of the pullover tunic with standing collar by a single-breasted, open-collar coat. Shoulderboards and collar tabs of the service uniform are in the color of the branch of service; shoulderboards, collar tabs, and buttons of the field uniform are olive drab. Officers and career noncommissioned officers wear olive-drab instead of blue trousers with the service uniform.

The uniforms of naval forces personnel remain unchanged on the whole except for the summer service uniform worn by officers and career noncommissioned officers, whose white and blue, standing-collar coats are being replaced by a white, double-breasted, open-collar coat and a blue, open-collar tunic, respectively. White shirts and black ties are worn with coat and tunic.

The new parade-off duty uniforms for officers and enlisted men of the ground and air forces and the standard service uniforms for officers and enlisted personnel of the naval forces are illustrated in Figures 145 and 146, respectively.

b. **INSIGNIA**—Soviet personnel wear a variety of insignia to indicate grade and branch of service. The grade of officers is indicated by varying numbers of stars and stripes on the shoulderboards, the stars differing in size and number according to the grade. In

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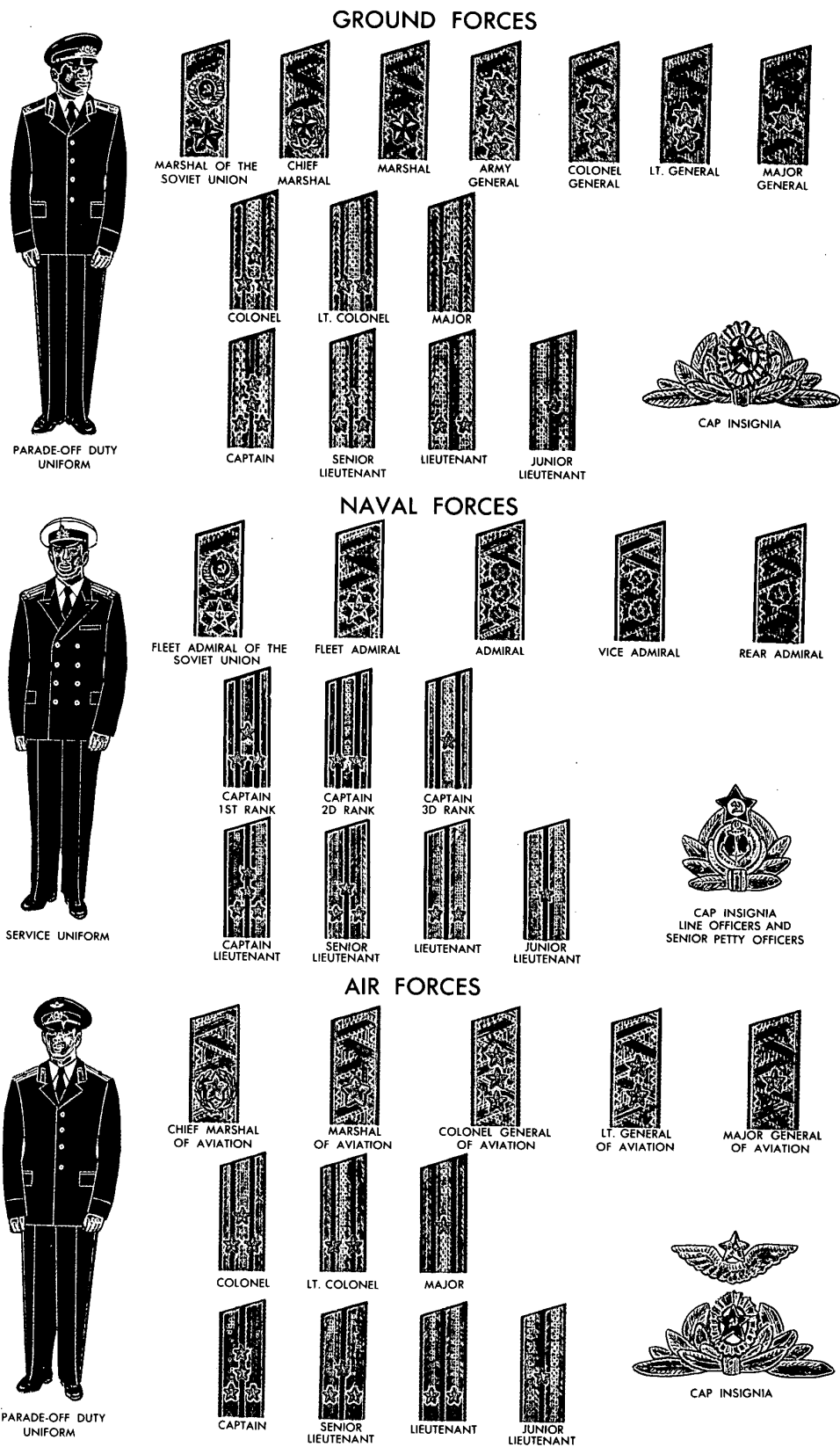


FIGURE 145. Officers' uniforms and insignia (U/OU)

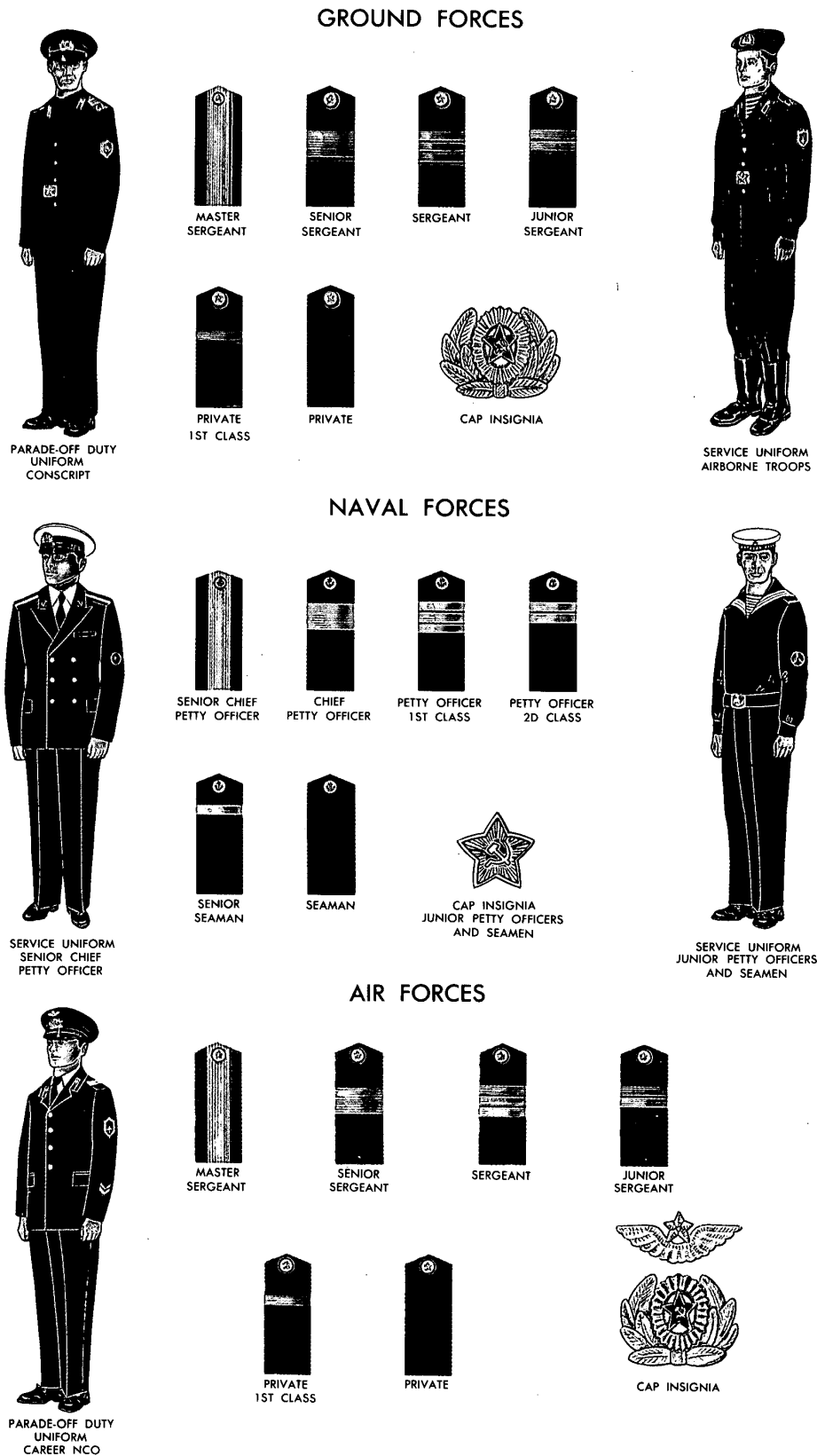


FIGURE 146. Enlisted men's uniforms and insignia (U/OU)

addition, naval officers wear sleeve insignia on several of their uniforms. The grade of enlisted personnel is indicated by transverse stripes on the shoulderboards. Insignia are shown in Figures 145 and 146.

Branch-of-service insignia are usually worn on collar tabs. When the uniform does not include collar tabs, the insignia are worn on the shoulderboards. Branch of service also is indicated by various colors on the shoulderboards; the collar tab; cap bands on service and dress caps; and the piping on shoulderboards, collar tabs, cap crowns, overcoats, and trousers or breeches. Marshals, generals, and admirals wear distinctive ornamentation on coat-collar lapels in lieu of collar tabs.

Enlisted personnel of the ground forces display the metallic letters "CA" (Soviet Army) on the shoulderboards. All enlisted personnel of the ground and air forces wear a distinctive shoulderpatch, portraying the insignia of the combat arm or service, on the upper left shoulder sleeve. Students at military schools of the ground forces wear service stripes on the upper left sleeve below the shoulderpatch, the number of stripes corresponding to the number of years completed.

Reenlistment chevrons are worn on the lower left sleeve of the coat by career enlisted personnel of the ground and air forces.

B. Ground forces

The ground forces have been designed primarily for exploitation of nuclear strikes and conduct of swift offensive operations to defeat enemy troops and seize enemy territory. In the European theater of operations, the ground forces are to destroy NATO troops and rapidly dominate Western Europe. Their capability to fulfill their doctrinal missions relies heavily on the achievement of surprise and success of the strategic strikes.

The ground forces have been undergoing a continuous program of modernization and reorganization since World War II. Changes have been based primarily on the development of new weapons and equipment, modifications in organizational concepts, and the formulation of new operational and tactical doctrine designed for the conduct of war in a nuclear environment. The most significant aspect of the modernization and reorganization program in recent years has been the emphasis on tanks and armored personnel carriers, which has made both the motorized rifle division and the tank division formidable armored organizations by Western standards.

In addition, the introduction of new weapons and additional standard weapons has given the ground forces substantial increases in firepower at division and army levels. This has been especially evident in three important areas of artillery: field, antitank, and antiaircraft.

Soviet field artillery, already a powerful arm, has increased in both quantity and quality. In motorized rifle regiments, a battery of six 122-mm howitzers has replaced the six 120-mm mortars which were shifted

down to the motorized rifle battalions. Motorized rifle division artillery regiments have been reequipped with the D-30 122-mm howitzer, which has a greater range and better antitank capability than the older M-30. An additional battery has been added to the 152-mm howitzer battalion, increasing its strength from 12 to 18 tubes.

Rocket-launcher strength in the motorized rifle and tank divisions also has increased from 12 to 18 launchers; the BM-21, a 40-tube 122-mm weapon, is replacing the 140-mm and 240-mm launchers formerly standard in motorized rifle and tank divisions, respectively. The BM-21 has more launch tubes and its rockets have greater range. In the tank division, a full battalion of 122-mm howitzers has been added to the two already present.

Soviet emphasis on improving antitank gun and guided-missile capabilities continues. Motorized rifle battalions have received additional armament. The two towed 57-mm guns are being replaced by two 76-mm SPG-9 recoilless guns and two man-packed SAGGER antitank guided missiles. This mix of weapons provides excellent armor penetration at ranges to about 3,000 meters. The new armored amphibious infantry combat vehicle, BMP, with its smoothbore 76-mm gun and SAGGER antitank guided missile, apparently intended for the motorized rifle squad, is another example of emphasis on antitank capabilities. In addition, motorized rifle regiments have a battery of nine launch vehicles for the SNAPPER, SWATTER, or SAGGER antitank missiles.

The motorized rifle division now has an additional battery of 100-mm guns, increasing the number of these guns from 12 to 18. In some units, a new smoothbore 100-mm gun, M-1965, is replacing the older M-55.

The Soviets have introduced a number of weapons to improve the air defenses of the ground forces. The ZPU-4 14.5-mm antiaircraft machinegun is being replaced gradually by the 23-mm ZU-23-2 automatic gun in motorized rifle regiments. The ZSU-23-4, mounted on a tracked individual chassis with on-carriage fire-control radar, has appeared in tank and motorized rifle divisions. The divisions' antiaircraft regiments still have 24 towed 57-mm S-60 guns. FIRE CAN radars and PUAZO series fire directors are being replaced by the new FLAP WHEEL radar.

As the modernization of the ground forces has progressed, Soviet helicopter forces have developed increased flexibility. The heavy-lift helicopters already have a greater lift capacity than any other helicopter in the world. The present Soviet concept for the employment of helicopter-borne forces apparently utilizes motorized rifle troops in coordination with helicopter regiments.

Approximately 1,250 helicopters—260 Hook (Mi-6), eight HARKE (Mi-10), 430 HOUND (Mi-4), 140 HIP (Mi-8), and 420 HARE (Mi-1) and HOPLITE (Mi-2) are allocated by Military Transport Aviation (VTA) to the tactical air armies within the U.S.S.R. and to the Soviet groups of forces in Eastern Europe. Most of these

aircraft are unequally distributed among 19 known helicopter regiments. Hook, HARKE, HOUND, and HIP provide the basic heavy-lift and assault capabilities. The smaller lift characteristics of HARE and HOPLITE make them more suitable for liaison, reconnaissance, artillery fire direction, and antitank warfare. Helicopter-borne assaults, as demonstrated in Warsaw Pact exercises, probably would be employed in time of war to seize key areas ahead of advancing armor. Exercises indicate that the Soviets consider a reinforced motorized rifle battalion as most adaptable for such a mission.

With the increased conventional artillery and helicopter-borne assault capabilities, the Soviets have exhibited a flexibility in practice which lends substance to the possibility that war with NATO may be, initially at least, conventional.

Concurrently, there have been improvements in the missile and rocket systems available to provide nuclear and chemical, as well as conventional, fires. Most, if not all, free rocket over ground (FROC) battalions of divisions deployed in forward areas have added a fourth launcher to the three formerly assigned. SCUD tactical missile brigades in the Group of Soviet Forces, Germany (GSFG), and probably those in the Soviet western border areas and the Far East Military District have acquired a third battalion, increasing the number of launch vehicles from six to nine. In addition, two of the brigades in the GSFG, at least, appear to have 12 launch vehicles each.

To satisfy the need for a tactical missile system with the range and mobility suited to the needs of the *front*, the Soviets have developed a 500-nautical-mile missile, the SS-12. The SS-12 is probably carried by the SCALEBOARD transporter-erector-launcher. Although the SS-12 has not been observed deployed with ground forces, it is likely that it would be used in support of theater of operations if required. The increasing availability of these varied rocket and missile systems provides the theater forces with important delivery capabilities for nuclear, chemical, and high-explosive warheads.

The requirement for improved logistical support increased sharply with the modernization and increased mechanization of the ground forces. Soviet efforts to modernize their support elements as well as their

maneuver units have led to the introduction of tactical pipeline units; greater emphasis on helicopters; the appearance of new and better vehicles, including tank transporters (Figure 147); and the development of improved bridging equipment. The operating range of vehicles throughout the theater forces has been improved through the extensive addition of auxiliary fuel tanks for the vehicles.

1. Organization

The Commander in Chief of the Soviet Ground Forces participates in operational planning but is not in the operational chain of command. Within the Ministry of Defense, the responsibilities of the Commander in Chief of the Soviet Ground Forces include administration of the ground combat and certain technical arms, development of tactical doctrine and training programs, and supervision of training.

The largest field command in wartime is the *front*, formed from certain military districts and groups of forces. It is a tactical and administrative unit consisting of several ground armies, an air army, and supporting combat and service units. In peacetime, forces stationed outside the country, except for two divisions in Mongolia, are under groups of forces headquarters—one each in Czechoslovakia, East Germany, Hungary, and Poland. The two divisions in Mongolia apparently report to the Transbaykal Military District.

Directly subordinate to the Ministry of Defense in both peace and war are the 16 military districts of the U.S.S.R. These are tactical and administrative commands, organizationally similar to the groups of forces. Being territorial in nature, military districts are charged with several housekeeping responsibilities such as logistic support for schools, depots, and miscellaneous military activities, as well as the administration of conscription, reserve training, and mobilization activities.

Ground armies are of two basic types—combined arms and tank; a typical combined-arms army would consist of three motorized rifle divisions and one tank division; a typical tank army would consist of three tank divisions and one motorized rifle division. Combat support units in both types include a surface-to-surface guided missile brigade (SS-1), one or two SAM regiments, an artillery brigade, an engineer regiment, a

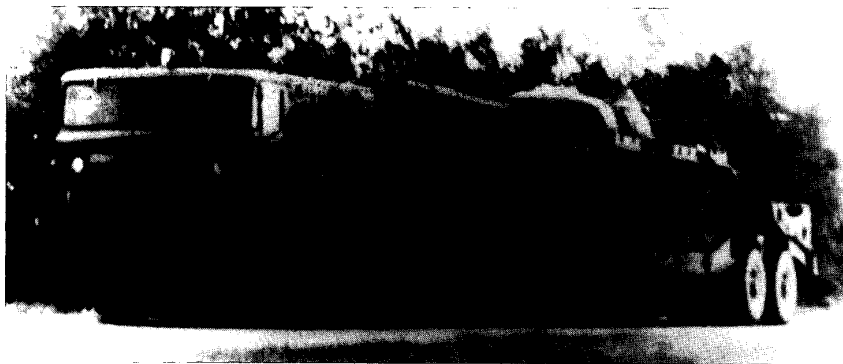


FIGURE 147. MAZ-537 truck with lowboy trailer carrying T-62 medium tank

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ponton bridge regiment, an assault crossing battalion, a signal regiment, two signal intercept battalions, a radio-relay battalion, a line construction battalion, a chemical defense battalion, and intelligence elements. Service support, including medical, transportation, and quartermaster, is provided in both types of armies by numerous units subordinate to the deputy commander for the rear.

Many of the support units listed above at army level also may be found directly subordinate to groups of forces, military districts, and to the Ministry of Defense. These would be expected to become *front* level units in wartime. A typical *front* would have an artillery division armed with 152-mm gun-howitzers and 130-mm guns. Two SS-1 brigades (or a follow-on system) would provide *front* surface-to-surface missile support with two SAM regiments providing air defense. The GANEF (SA-4) missile is used with the field forces (Figure 148). Combat engineer support of a *front* would include a general-purpose engineer brigade, two ponton bridge regiments, and three assault-crossing battalions. Signal support would be provided by a signal brigade, two signal intercept regiments, and two radio-relay battalions. A chemical brigade and intelligence elements complete the combat support elements of a *front*. Service support would be provided by a multitude of directorates, agencies, and units subordinate to the *front* deputy commander for the rear.

The majority of line divisions are of two basic types—the motorized rifle division and the tank division. The main fire and maneuver elements of the motorized rifle division are three motorized rifle regiments, each of which consists of three motorized rifle battalions transported in armored carriers, supported by regimental reconnaissance and artillery units and a battalion of medium tanks; a tank regiment with three tank battalions; and a reconnaissance battalion equipped with seven light amphibious tanks (Figure 149). Division combat support elements include an artillery regiment, a FROG battalion, an antitank battalion, an antiaircraft artillery regiment, a multiple rocket launcher battalion (Figure 150), an engineer battalion, a signal battalion, and a chemical defense company. Division service support elements consist of a medical battalion, a motor transport battalion, a repair and maintenance battalion, and other rear service elements.

The principal combat elements of the tank division are three medium tank regiments, a motorized rifle regiment, and a reconnaissance battalion. All these units are practically identical in organization to their counterparts in the motorized rifle division. Divisional combat support includes an artillery regiment, a FROG battalion, an antiaircraft artillery regiment (Figure 151), a multiple rocket launcher battalion, an engineer battalion, a signal battalion, and a chemical defense company. Division service support consists of a medical

FIGURE 148. GANEF (SA-4) surface-to-air missile system

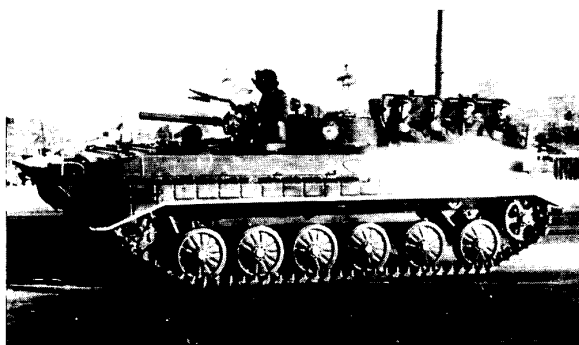
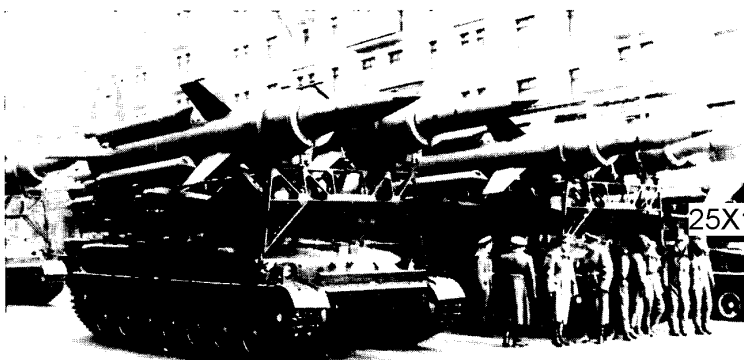


FIGURE 149. Amphibious armored infantry combat vehicle, M1967

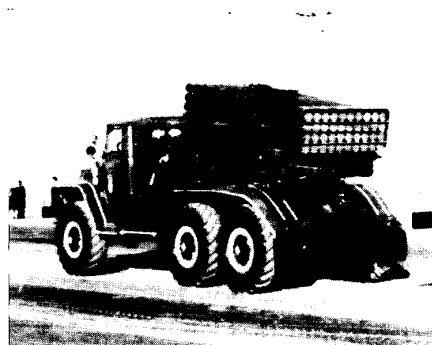


FIGURE 150. 122-mm. 40-round rocket launcher on Ural 375 M1964 truck

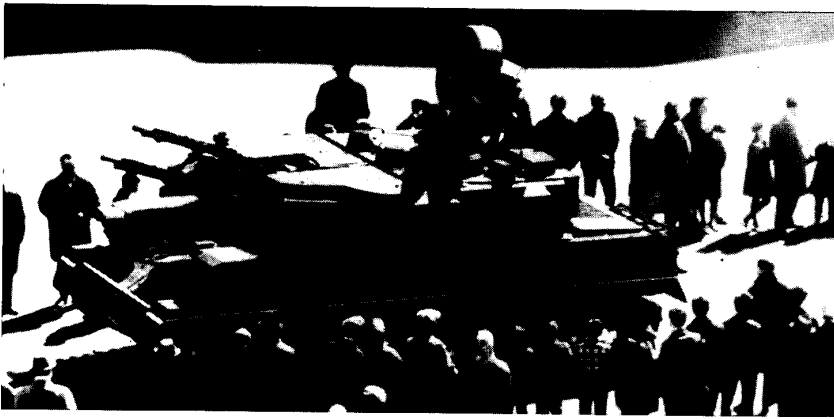


FIGURE 151. ZSU-23-4 anti-aircraft
weapon

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battalion, a motor transport battalion, a repair and maintenance battalion, and other rear service elements.

The ground forces also have an airborne division organized around three parachute regiments. Supporting elements include an artillery regiment, an assault gun battalion, and an anti-aircraft artillery battalion, along with medical, signal, engineer, chemical defense, and service elements.

2. Strength, composition, and disposition²³

Personnel strength of the general-purpose ground forces is about 1,410,000. Principal ground forces organizations are: 20 combined-arms armies and tank armies; 14 army corps; 99 motorized rifle divisions, 54 tank divisions, seven airborne divisions, nine artillery divisions; and more than 50 separate artillery, missile (SS-1—Scud), and rifle brigades. The current deployment of these forces places the majority of the divisions either in the groups of forces in Eastern Europe or in the more strategic border areas of the U.S.S.R., the greatest concentration being in the western border districts. All command and control headquarters are also in peripheral areas.

3. Training

Training procedures, in general, emphasize the fundamentals of soldiering. Prior to the enactment of the military service law of 1967, the conscript underwent three 1-year training cycles before he was released from active duty. Under the 1967 law, conscripts serve only 2 years; the biannual induction has required an adjustment in the training cycle.

Noncommissioned officers in the ground forces receive their training primarily within schools of the regiments and separate battalions of divisions. In peacetime, all regiments operate these schools to supply noncommissioned officers for line duty within subordinate units of the division's main arm. Technical service noncommissioned officers for all units of the divisions are provided by noncommissioned officer schools operated by the ancillary units of the division,

such as the engineer, motor transport, and signal battalions. In addition to the unit school system, each military district and group of forces has its own training units or schools which graduate noncommissioned officers for the special troops of the military district or group.

Officers are trained through a progressive system of military schools. This network begins with cadet and officer candidate schools and progresses through advanced branch schools or academies to the highest military academies in the U.S.S.R. Among the more important schools are the M. V. Frunze Military Academy, the Military Academy of Chemical Defense, the V. I. Lenin Military Political Academy, and the Military Academy of Armored Troops.

Courses range from 3 to 5 years. All activities of these schools and academies are supervised by a special directorate for military educational institutions in the Ministry of Defense. In general, the military school system has proved successful in developing highly qualified leadership.

The semimilitary organization DOSAAF serves the ground forces in two chief ways. First, since all citizens above the age of 15 are urged to join DOSAAF, it is able to provide preinduction training of an elementary nature for several years prior to most youths' actual induction into military service. Second, this civilian society develops for members of all ages certain specialist skills which are of potential value to the ground forces, such as motorcycling, driving, skiing, parachuting, glider training, small-arms marksmanship, horsemanship, vehicular maintenance and repair, and the operation of signal equipment. Local chapters or clubs of DOSAAF usually stress those skills applicable to a particular branch of service. Appropriate equipment, as needed, is made available from nearby military units. DOSAAF plays an important part in the compulsory military training dictated by the 1967 military service law.

Field training in the ground forces is conducted according to an annual training program. Because of the biannual induction, the training program has been adjusted somewhat to include two 1-month training periods for inductees on arrival at their new unit. This

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training is conducted separately and runs concurrently with the annual training program. Regular units of the division which contain trained troops may leave the garrison area for field exercises, leaving the recruits behind under a cadre of instructors to continue basic training. On completion of each of the 1-month training periods, the recruits are integrated into their assigned units and thereafter participate in the annual training program. Under this concept, tactical combat training up to army level may be carried out at all times of the year. High-level combined and joint exercises and both command post and field training exercises also are held throughout the year. This training insures year-round combat readiness and utilizes training areas, particularly those in Eastern Europe, to the maximum. Overall, the combat readiness of the ground forces is being maintained, particularly in units in Eastern Europe.

During the period 1953-65 ground forces training featured nuclear settings, and all offensive and defensive field exercises were based on nuclear scenarios. In 1965 the Soviets introduced a flexible response plan to supplement their nuclear concept. This plan calls for the use of conventional weapons during the initial stages of a war with NATO and has been evidenced by recent increases in conventional artillery with ground forces divisions. The shift toward flexible response has not reduced the importance of nuclear firepower nor has it changed the mobile dispersal posture of the battlefield for tactical operations.

Warsaw Pact exercises are held at least once annually. These exercises generally involve ground forces of at least three Warsaw Pact countries. The exercises are directed by the Minister of Defense of the country on whose territory the exercise is held. Within Eastern European countries in which groups of Soviet forces are stationed, national forces and Soviet forces train together several times a year. This Warsaw Pact exercise activity has resulted in increased combat efficiency for the non-Soviet Warsaw Pact forces and has improved their capabilities to work closely with the Soviets in any operations against NATO.

4. Logistics

In the U.S.S.R., logistic support is planned in the Ministry of Defense by the Chief of the Rear on the basis of plans drawn up by the General Staff of the Soviet Armed Forces. At each echelon from *front* down through regiment, the deputy commander for the rear coordinates and supervises all logistic activities, whether performed by elements directly subordinate to him or by other elements of the headquarters and staff. He provides the logistic part of staff planning and directs the use of all transportation facilities. He is directly responsible for the supply of common-use items such as rations, clothing, fuel, and medical supplies. He coordinates and supports the supply and service functions performed by combat arms (such as supply of weapons and ammunition by the artillery arms).

Each military district commander has administrative control over units located within his area. He provides logistic support for them through a system of military district depots under the deputy commander for the rear of the district. These depots draw from the central depots of the Ministry of Defense which are strategically disposed throughout the U.S.S.R. The bulk of the strategic reserves of military materiel and supplies is maintained in the central depots, while unit mobilization reserves are kept either with the units or in the military district depots.

Wartime supply of troops in the field is accomplished through depots assigned at *front* and field army levels. *Front* level depots may deliver their stores to army forward or rear depots or divisional supply points. The impetus of supply is forward; rail transportation is used as far forward as possible, although increased motorization at all levels and product pipelines have materially increased transportation capabilities.

The maintenance system has undergone considerable modernization since World War II. Not only are repair facilities more numerous and extensive, but their technology, versatility, and general efficiency have increased. The system appears adequate for present needs of the ground forces. Modern repair and recovery units are at all echelons, and continuing emphasis has been placed on the training and procurement of technicians. Maintenance doctrine emphasizes the repair of equipment and vehicles as close to the front line as possible, either by the users of the equipment or by mobile repair crews sent out by the parent unit or a higher echelon. Where on-the-spot repair is not feasible, speedy evacuation is emphasized. Separate evacuation battalions are organized at army level for removing damaged vehicles to repair bases at division and higher echelons. Heavily damaged tanks, trucks, and field artillery pieces are evacuated to plants in the interior for rebuilding or scrapping.

Military stockpiles of ground forces materiel are believed to be sufficient to equip fully the 161 line division force at wartime strength, although in some divisions, as well as nondivisional support units, certain motor transport and engineer items would have to be mobilized from civilian resources. Since World War II the quality of ground forces materiel has continually improved with the introduction of a wide range of new types of equipment, including missile and combat vehicles. Due to the uneven distribution pattern of equipment, however, many of the older models remain in service.

C. Naval forces ()

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The missions of the Soviet Navy are to: counter the threat from enemy submarines, including ballistic missile submarines; counter Western naval forces, particularly carrier task forces; interdict sea lines of communication; defend the offshore zone and support land operations; contribute to strategic deterrence; support Soviet policies abroad; and provide surveillance and collect intelligence.

To accomplish these missions, the navy is divided into four fleets—Baltic, Black Sea, Northern, and Pacific. The majority of the missile and long-range attack submarines are based in the Northern and Pacific fleets. While each of the fleets is capable of accomplishing its assigned missions without recourse to immediate support from another area, geographic and climatic factors limit Soviet access to the open ocean and prevent rapid reinforcement and resupply between the four widely dispersed fleet areas.

Despite the large naval forces available to them at the outbreak of World War II, the Soviets, generally regarding their navy as the seaward extension of the ground forces, failed to make effective use of their seapower. After the war, the Soviet Union set about reconstruction of its devastated naval and shipbuilding facilities and embarked upon an intensive naval construction program designed to transform the U.S.S.R. into a major naval power. This program concentrated on producing large numbers of cruisers, destroyers, mine warfare ships, and long-range submarines. Current ship construction programs encompass guided missile cruisers, frigates, destroyers, and patrol boats; amphibious and mine warfare ships; logistic support ships; and nuclear-powered ballistic missile, cruise missile, and torpedo attack submarines. The present surface combatant construction reflects Soviet determination to make their fleet viable beyond the range of Soviet shore-based aircraft by increasing their antiaircraft and antisubmarine warfare armament, while at the same time improving the effectiveness and flexibility of their antishipping cruise missile capabilities.

During the period 1947-57, the Soviets completed 19 cruisers, more than 100 destroyers, 72 destroyer escorts, nearly 1,000 patrol craft of various types, about 330 minesweepers, a number of auxiliary types, and about 350 submarines (more than three-fourths of which were of postwar design). This program had actually begun to level off in about 1956, when the changes in Soviet naval thinking that probably followed upon Stalin's death in 1953 began to take practical effect. These changes took into account the advances in naval technology, particularly nuclear propulsion for submarines, nuclear-armed missiles, and modern electronics, and aimed at the qualitative rather than

quantitative improvement of Soviet naval capabilities. The naval building program declined sharply after 1956, but by 1958 the first missile-equipped surface ships and submarines began to appear.

In the mid-1950's two of the *Sverdlov* class light cruisers were converted to SAM guided missile cruisers. One was subsequently scrapped; the other still serves the Black Sea Fleet. By late 1959 two classes of guided missile destroyers and two classes of guided missile patrol boats were in service. The *KILDIR*,²⁴ which was constructed on a *KOTLIN* hull, served as the first guided missile destroyer (DDGS). It was followed by the *KRUPNYY* class DDGS (the first serially constructed DDGS built as such from the keel up), which is armed with a single SSM launcher fore and aft. Both classes carry the SS-N-1 missile, which has a maximum range of up to 130 nautical miles and can be employed both in an antiship and shore bombardment role.

The *Osa* I class large guided missile patrol boat (Figure 152) and the *KOMAR* class small guided missile patrol boat are equipped with the SS-N-2 (*STYX*) missile, which can be employed against both ship and shore targets at up to a maximum range of 22 nautical miles. A new version of the *Osa* class, designated the *Osa* II, with smaller elevatable cylindrical launchers is being built. This version carries a new variant of the SS-N-2, designated the SS-N-2b, with folding wings. In addition, a new missile system, designated the SS-N-11, is now being introduced aboard *Osa* I and *Osa* II class units.

Since 1959 the development of missile armament in the navy has proceeded at a rapid pace. In 1962 the first of four *KYNDA* class guided missile light cruisers (CLGM) was completed. It incorporated both SSM (eight missile launchers) and SAM (one twin SA-N-1 launcher) armament. The SSM is the SS-N-3b, which has a likely maximum operational range of 150 nautical miles. Also in 1962, the first *KOTLIN* class destroyer was converted to carry a twin SA-N-1 launcher aft. Conversion continues in two fleet areas. In 1963 a new gas-turbine-propelled guided missile frigate (DLG), the

²⁴NATO code names assigned to ship types, missiles, aircraft, and electronic gear are indicated by the use of caps and small caps. Ship classes based on known names of Soviet ships are italicized (e.g., *Sverdlov* class light cruiser, *Moskva* class guided missile helicopter ship).



FIGURE 152. *Osa* class large guided missile patrol boat

25X1

KASHIN class, was completed. Its armament includes two twin SA-N-1 SAM launchers. Construction of the KASHIN class DLG is continuing. The KRESTA I class CLGM, which has two twin SS-N-3 SSM launchers and two twin SA-N-1 SAM launchers, was completed in 1967 (Figure 153).

Four KRESTA I class CLGM are now operational and class construction has terminated. Also in 1967, the first modified KRESTA I class CLGM, designated KRESTA II, was launched (Figure 154). The first unit became operational in 1969, a second in 1970, and other units are now under construction. The KRESTA II is fitted with an improved SAM system, the SA-N-3 GOBLET. In addition, the SS-N-3 launchers of the earlier KRESTA I have been replaced by two new quadruple missile launchers for the new 25-to-35-nautical mile SS-N-10 antiship cruise missile. The KRESTA II also is fitted with the *Moskva*-type three-dimensional radar and a helicopter platform and hangar for the HORMONE (Ka-25) helicopter.

In 1968 the *Moskva*, the first guided missile helicopter ship (CHG) (Figure 155), became operational; a second, *Leningrad*, became operational in mid-1969. These units are armed with two twin SA-N-3 GOBLET launchers and a twin SUW-N-1 antisubmarine launcher which fires the FRAS-1 weapon. The primary mission of the helicopter ship is ASW, but it is capable also of significant AAW and task force command ship functions. Also in 1968, the first conversion of a KRUPNYY class guided missile destroyer (DDGS) to a SAM configuration was completed and given the class name KANIN (Figure 156). All SSM armament was

removed and replaced by additional guns, ASW armament, and SA-N-1 SAM launchers. Two additional KRUPNYY class DDGS have been converted since, and others are under conversion. The next addition in missile-armed combatants is the NANUCHKA class guided missile patrol gunboat (PGG) (Figure 157). The first of these became operational in the summer of 1969. NANUCHKA's surface-to-surface missile, housed in two triple-tube launchers, is believed to represent a modification of the SS-N-3. The horizon range capability of this SSM is probably about 30 nautical miles. Using a BEAR (Tu-95) or a HORMONE (Ka-25) helicopter for target indication, this weapon could be fired to a range of about 100 nautical miles.

In December 1970, a new destroyer class of about 400 feet was seen in the Baltic. This ship, designated KRIVAK class, carries one probable SSM launcher and a possible SAM launcher forward. This class may develop into the largest destroyer production program in the history of the Soviet Navy.

As of January 1971, the submarine force consisted of 23 classes, of which 12 were equipped either with cruise or ballistic missiles. Since 1968, six new classes have been added to the operational inventory: Y Class nuclear-powered ballistic missile (SSBN), C Class nuclear-powered cruise missile (SSGN) (Figure 158), V Class nuclear-powered (SSN) (Figure 159), A Class nuclear-powered (SSN), P Class nuclear-powered (SSGN), and B Class (SS).

Three (the Y, C, and V) of the six new classes are second-generation nuclear-powered submarines; and the A and P may be third-generation nuclear-powered

FIGURE 153. KRESTA I class guided missile light cruiser

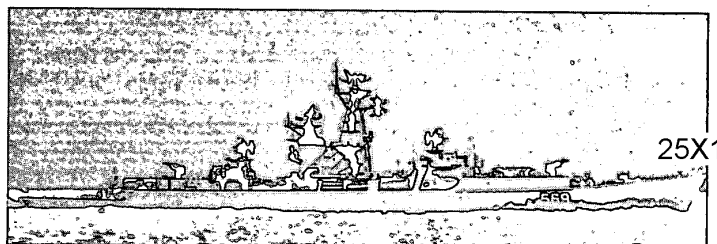


FIGURE 154. KRESTA II class guided missile light cruiser

25X1



FIGURE 155. Moskva, a guided missile helicopter ship

25X1

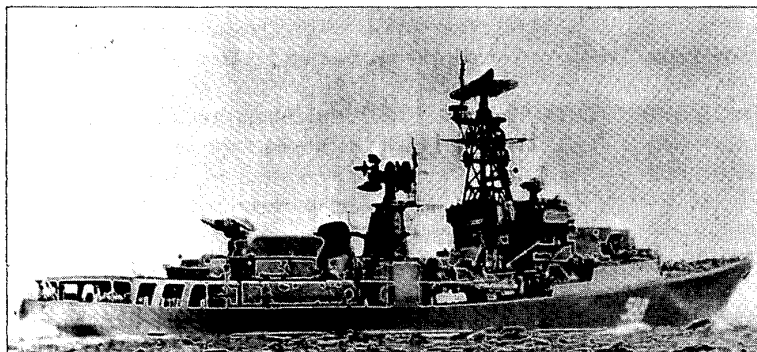
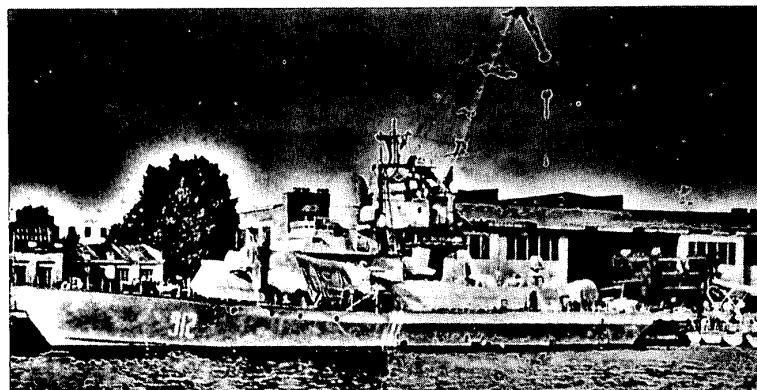


FIGURE 156. KANIN class guided missile destroyer

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At pierside, with missile launcher and 57 mm anti-aircraft mount covered by canvas

At sea, with equipment unshrouded

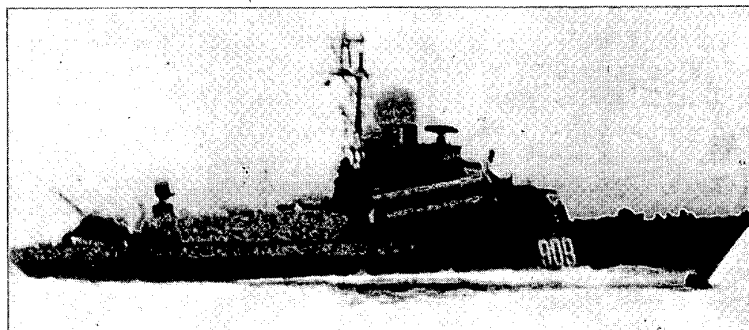


FIGURE 157. NANUCHKA CLASS GUIDED MISSILE PATROL GUNBOAT

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FIGURE 158. C Class nuclear-powered
cruise missile submarine

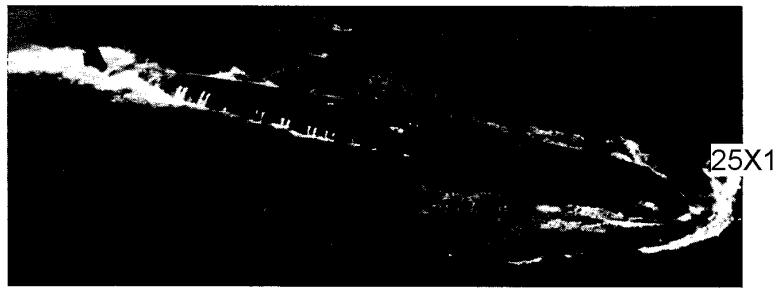
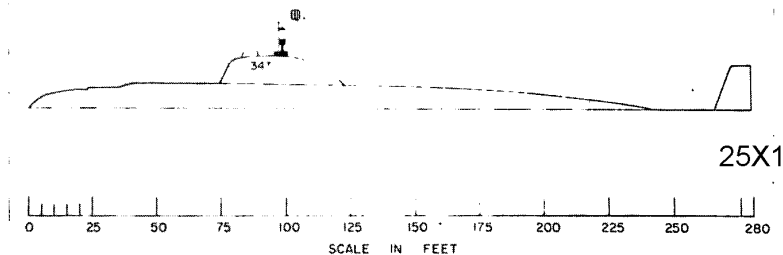


FIGURE 159. V Class nuclear-powered
submarine



submarines. The P appears to be similar to but considerably larger than the C.

The Y Class SSBN is in series production at two shipyards. One shipyard is in the Severodvinsk area in the Northern Fleet, while the second shipyard is at Komsomol'sk in the Pacific Fleet. The Y Class program at Komsomol'sk is believed to have produced its first Y Class in the summer of 1969, almost 2 years after the first Y delivery (late in 1967) to the Northern Fleet. The Y Class carries sixteen 1,300-nautical-mile, submerged-launched SS-N-6 ballistic missiles.

Unique to the navy is the diesel-electric or nuclear-powered cruise missile submarine. The navy's latest entries into the cruise missile force are the C and P SSGN Classes. The first evidence of the C Class was early in 1968 in the Northern Fleet. The P Class was first observed in the same area early in 1971. The C Class carries eight SS-N-7 missiles in its bulbous bow. The P Class, which has a similar but larger bow, is estimated to carry antiship cruise missiles also, although they have not been identified. Unlike other nuclear-powered cruise missile submarines, the C and P Classes are believed to have submerged-launch capabilities. The range of the SS-N-7 is estimated to be up to 40 nautical miles, but the range of the P Class missile is unknown.

Probable follow-on to the N Class nuclear-powered submarine is the V Class, first observed under construction at the Admiralty Shipyard in Leningrad. Like the C Class SSGN, the V became operational in 1968; it is estimated to be the fastest submarine in the world, with a maximum submerged speed of at least 32 knots. The V Class is in series production, eight units having been built as of July 1970.

The B Class submarine, a small submarine approximately 220 feet long, is under construction at Komsomol'sk Shipyard. The B Class propulsion system

for submerged operations and the mission of the B Class are undetermined. It is believed that the B Class utilizes diesel propulsion in a surfaced condition.

The remaining new-generation class of submarine reported under construction is the A Class. Both the mission and propulsion system are undetermined as of early 1971.

A new class Soviet submarine was sighted late in 1970 operating at sea in Northern Fleet waters. The submarine was sighted on the surface operating independently and could not be correlated to any known Soviet submarines. The hull of the submarine was reported to resemble that of a C Class nuclear-powered cruise missile submarine (SSGN). The observed length of 350 feet, however, was much longer than the C Class length of 308 feet. The sail of this unit was similar to that of an E Class SSGN, and the bow was extremely broad and bulbous. Neither the propulsion nor the weapon system on this unit is known; however, nuclear-powered propulsion is estimated. Because of its resemblance to the C Class SSGN, it is possible that this class may incorporate a cruise-missile system in the area forward of the sail. Only one unit of the class has been observed to date. Although no data available indicate that the class is in series production, this submarine has been designated P Class SSGN.

First-generation ballistic missile submarines (SSB) and nuclear-powered ballistic missile submarines (SSGN) continue to remain active in naval operational units. The H-I to H-II SSBN conversion program was concluded early in 1970, while the G-I to G-II SSB program continues (Figure 160). By mid-1970, 11 units had been converted to the G-II configuration. While the G-I carries three 300-nautical-mile, surfaced-launched SS-N-4 ballistic missiles, both the G-II and H-II carry three 700-nautical-mile submerged-launched SS-N-5's.

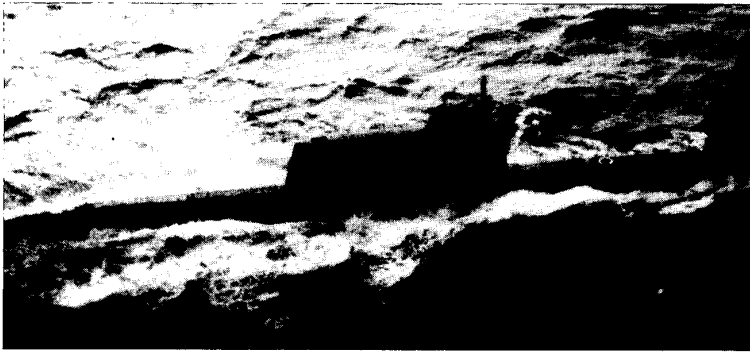


FIGURE 160. G Class ballistic missile submarine

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One H-I unit is estimated to have been converted to carry six missile launchers. Designated H-III, this class is probably a research and development missile test platform, probably for the new 3,000-nautical-mile SS-NX-8 SLBM presently being tested by the Northern Fleet. Similar conversions of H-II to H-III are not expected. Only three Z-Conversion Class SSB remain active. In the next few years the Z-Conversion, the navy's first ballistic missile submarine, will either be placed in a reserve training status, converted to a research and development platform, or scrapped. The Z-Conversion carries two SS-N-4 missiles.

The older cruise missile submarines are the E-I and E-II, J, and W Classes. Two Pacific Fleet E-I nuclear-powered cruise missile submarines have had their missile tubes removed in the course of conversion to nuclear-attack submarines. The remaining three Pacific Fleet E-I's will probably be converted to the E-I SSN configuration. The E-I SSGN carries six SS-N-3 cruise missiles. The E-I follow-on, the E-II, carries eight SS-N-3's. The maximum operational range of the SS-N-3 is 220 nautical miles. The J Class cruise missile submarine (SSG) program concluded in 1969 with a total of 16 units constructed. The J Class carries four SS-N-3a missiles and is the only diesel-powered cruise missile submarine (SSG) actively engaged in out-of-area operations. The navy's oldest operational SSG, the W Class LONG BIN (four launcher) and TWIN CYLINDER configurations, have not been deployed out-of-area in recent years. The W Class SSG's have been restricted to in-area waters—the Sea of Japan and the Baltic, Barents, and Black Seas.

Qualitative improvements in capabilities have been evident in areas other than missile armament and nuclear propulsion. Research and development efforts in ASW since 1960 are apparent in the employment of improved sensors and weapons. New models have been installed in some units. For example, low frequency sonars of 3.0 and 4.5 KHz plus a variable depth sonar (VDS) are fitted on the *Moskva* class, and 8.0 KHz sonars probably have been fitted on KANIN and KRESTA II class combatants. Conversion of KRUPNYY SSM (SS-N-1) configured guided missile destroyers to KANIN class SAM (SA-N-1) configured guided missile destroyers, with improved ASW qualities, continues. Additional units of the KASHIN guided missile frigate are under

construction, and the improved KRESTA II guided missile light cruiser is expected to provide more adequate ASW capabilities. The new general-purpose destroyer KRIVAK, apparently carrying both surface-to-air and surface-to-surface missiles, along with improved ASW equipment, may serve as the replacement for the aging Soviet conventional destroyer and destroyer escort force and substantially upgrade Soviet open-ocean capabilities. More important, new equipment is seen as standard on the classes of ships in current production.

Mine warfare has had a significant share of research effort, culminating in a new acoustic-mine which has a considerable capability of selecting its target and presents sweeping problems. Developments of Soviet mine countermeasure forces have centered on the wooden-hulled VANYA class coastal minehunter, which first appeared in 1961. A new minesweeper, designated ZHENYA, was added to the naval strength in 1970. This 145-foot vessel may be constructed of wood-reinforced fiber glass; if so, it would be the largest ship in the world to be so constructed. ZHENYA has probably commenced series production and appears to have replaced the YURKA class fleet minesweeper program.

During the 1960's, the gas turbine and combined diesel and gas turbine propulsion systems were introduced, and great strides were made in the quality of support ships and auxiliaries. Improvements have taken place in electronic equipment, particularly in air search radar, communications, and electronic countermeasures.

The navy reactivated its naval infantry force in 1963 to provide a specially trained and equipped force to spearhead amphibious landing operations. Since that time the Soviets have continued to expand their amphibious strength and capability. The landing exercises that were conducted during 1968, 1969, and 1970, specifically Sever, Oder-Neisse, Okean, and Comrades in Arms, make it obvious that the Soviets are still developing their amphibious capabilities at a rapid pace. Amphibious ships and landing craft continue to be built in the U.S.S.R. The Soviet inventory includes 100 amphibious ships and an estimated 126 utility landing craft.

By January 1971 the naval infantry had reached a strength of over 14,000 men, representing two brigades in the Baltic Fleet, two brigades in the Black Sea Fleet,

one brigade in the Northern Fleet, and two brigades in the Pacific Fleet. The standard brigade includes approximately 2,100 men.

Since the end of the Arab-Israeli War in 1967, the Soviets have maintained normally one tank landing ship and two medium landing ships in the Mediterranean. This represents an amphibious landing capability of one battalion landing team (563 men and associated equipment).

The Soviet amphibious capability is most effective when limited to operations of a short-range tactical nature. At the same time, the size and prowess of their amphibious forces give the Soviets the capability of exercising a range of initiatives from show of force to direct intervention in limited strength in areas not contiguous to the U.S.S.R.

Soviet Navy coastal defense forces comprise the primary combat forces and equipment activated for the defense of important installations and coastal sectors. These forces include personnel at coastal gun and missile sites and their supporting echelons. Although most of the artillery has now been replaced by missiles, some naval bases remain partially dependent on guns for their protection. The initial missile in the coastal defense forces was the SSC-2b (SAMLET) missile. This highly accurate system still provides protection for major naval installations and straits on a point-defense principle out to a distance of 25 to 45 nautical miles from the coast. Improved capabilities have been realized with the SSC-1b (SHADDOK), a transporter-erector-launcher-type 250-nautical-mile missile, which is deployed in the Baltic, Black Sea, and Pacific Fleet areas.

Against this buildup of naval strength are arrayed a number of weaknesses. The navy is handicapped mostly by lack of adequate construction and repair facilities in each fleet area. The physical separation and the dependence on two fleets to provide most major construction is one of the major weaknesses. A limited open-ocean ASW capability and a vulnerability to carrier-launched air attacks remain a problem. Current construction and conversion programs, however, have emphasized ship and weapon production designed to lessen these problem areas. The Soviet Navy also lacks a high-speed underway replenishment capability. Underway replenishment is usually accomplished by the stern-to-bow or bow-to-stern methods, which are time consuming. Although the navy is able to provide adequate logistic support in peacetime with a combination of naval and merchant ships, its lack of proficiency in alongside underway refueling reduces flexibility and, in a conventional war, would make the ships vulnerable to attack during a replenishment operation.

The quality of naval personnel is generally high. The top echelons of command have been infused with dynamic and apparently well-qualified younger men. Rapidly advancing technology has placed a high premium on professionalism, and junior officers have

found incentives and room for advancement. Continued emphasis on complex exercises and realistic out-of-area training will improve personnel efficiency.

1. Organization

Since March 1953, the navy, as well as all other services, has been under overall operational control of the Minister of Defense. The Commander in Chief of the Navy concurrently holds the position of a deputy minister of defense. In this capacity he participates in the formulation of top-level military policy decisions. Within the framework of the Ministry of Defense policy, the Commander in Chief of the Navy is responsible for the overall control, administration, development, training, and general state of combat readiness of the naval forces. He exercises this control through a main naval staff, a number of main naval directorates, and the commanders of the several fleets and flotillas.

The Main Naval Staff is the operations and planning organ of the Commander in Chief of the Navy. It is composed of a dozen or more subordinate directorates and departments, each of which is designated by a number as well as a title. The directorates of the Main Naval Staff which have been identified are: Operations (1st); Intelligence (2d); Observation and Communications (3d); Organization (4th); Radar (5th); Military Transportation (7th); Cryptographic (8th); Combat Training; Personnel; and Training and Replacements. The Main Naval Staff maintains close liaison with the General Staff of the Soviet Armed Forces, as well as with the staffs of the several fleets and flotillas. Detailed information on the functions of the Main Naval Staff is not available.

There are four principal naval main directorates and directorates: the Navy Political Directorate, Directorate of Naval Training Establishments, Main Directorate of Shipbuilding and Armaments, and the Directorate of the Rear, which is sometimes referred to as the Rear Services of the Navy. With the possible exception of the Directorate of Naval Training Establishments, each contains a number of subsidiary directorates and "services" (*sluzhby*). The difference between a "directorates" and a "service," if any, has not been determined. In addition to the naval main directorates and directorates, but apparently with a special status under the Commander in Chief of the Navy, is the naval academy.

The major operational forces are divided into four fleets, one for each of the principal maritime approaches to the U.S.S.R. These fleets are named after their respective geographic areas—Baltic, Black Sea, Northern, and Pacific. Each fleet is practically a self-contained force, having elements of naval aviation, coastal and antiaircraft defense, naval infantry, and the necessary rear services to support all the forces ashore and afloat. The organizational structure of a fleet parallels that of the navy as a whole, with the fleet commander responsible for all matters pertaining to his command. There are, in addition, two separate

flotillas—the Caspian and Kamchatka. The flotillas have independent status directly subordinate, at least in peacetime, to the Commander in Chief of the Navy. In time of war they would probably be subordinated to the nearest major fleet.

Since 1964, the Soviets have maintained a naval squadron in the Mediterranean. It has grown steadily in size and capability. In 1970 it averaged 48 surface ships and submarines. The political impact of the presence of this squadron has given it international status roughly equivalent to that of the U.S. Sixth Fleet. It is possible, therefore, that the Soviet Mediterranean Squadron is now a permanent force, has achieved a status equal to that of a flotilla, and therefore is directly subordinate to the Commander in Chief of the Navy in Moscow.

2. Strength, composition, and disposition²⁵

The personnel strength of the navy has remained fairly stable at about 470,000 for several years. The major fleet and flotilla strength consists of two guided missile helicopter ships; nine light cruisers; 11 missile cruisers; two old heavy cruisers; 37 guided missile destroyers; 44 destroyers; 111 destroyer escorts; and 351 submarines, including 51 ballistic missile submarines and 65 cruise missile submarines. In addition, there are 942 minor surface combatants, 405 mine warfare types, 226 amphibious ships and craft, and 725 auxiliary types. Some additional surface ships are in reserve status (four cruisers, 21 destroyers, nine destroyer escorts, and some minor combatants and auxiliaries). Also, 48 medium- and short-range submarines are believed inactive. These units could be restored to active service if required. In terms of total number of naval ships (but not total tonnage) the Soviet Navy is the largest in the world. Figure 161 shows the disposition of the Soviet Navy.

The Soviets repeatedly have stated that nuclear-powered missile-equipped submarines are the main striking force of their navy, and construction programs

reflect this. There is ample evidence, also, of efforts to improve the ASW capabilities of the submarine force. The new-construction submarine V Class has been built for an antisubmarine submarine role.

3. Training

The navy operates a large network of training establishments. All fleet areas contain schools for enlisted men, officers, and future officers. Leningrad is the chief center of training for naval officers and officer candidates. Severomorsk, Sevastopol', and Vladivostok are also important training centers. More than 100 separate training establishments are estimated to be in operation.

Unit training afloat and ashore is conducted in accordance with tactical and operational doctrine established for the navy as a whole. It is constantly underway, encompassing all types of training from squad drill to combined Soviet-European Communist countries fleet exercises, and it is rigorously supervised. Competitions and awards are liberally employed as incentives for individuals and units to attain high training standards.

Specialization is a basic principle of training. Separate higher naval schools train future officers for line, line-engineering, shore-engineering, submarine, communications, aviation, coast artillery, and political specialties, among others. It is usual for an officer to serve his entire career within the specialty for which he has been trained. Advanced specialization is just as much a goal of enlisted training as it is of officer training.

Political indoctrination is another important aspect of training, just as it is in the everyday life of all Soviet citizens. It is a standard feature in training afloat as well as in units and schools ashore and occupies a prominent part of all curriculums, training schedules, and leisure activities.

Inductees undergo a relatively short period of recruit training, after which they are assigned to operational units. The best qualified enlisted personnel may be sent to specialist schools, with consequent opportunities for advancement to petty officer. Outstanding enlisted

FIGURE 161. DISPOSITION OF ACTIVE UNITS OF THE SOVIET NAVY

	BALTIC FLEET	BLACK SEA FLEET	NORTHERN FLEET	PACIFIC FLEET	TOTALS
Helicopter ships.....	0	2	0	0	2
Cruisers.....	4	7	4	6	21
Destroyer and escort types.....	42	*59	44	45	190
Minor combatant, mine warfare, and amphibious types.....	486	**462	225	352	1,525
Auxiliary types.....	166	***160	187	184	697
Submarines.....	46	36	161	106	349
Total.....	744	726	621	693	2,784

*Includes three destroyer escorts and two escorts in the Caspian Sea.

**Includes 84 units in the Caspian Sea.

***Includes 15 units in the Caspian Sea.

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personnel are permitted to apply for officer training in a higher naval school. Until recently, however, preference was given to graduates of naval preparatory schools or civilian secondary schools.

Advanced training for officers is conducted at officer specialist schools on a level equivalent to that of the U.S. Navy postgraduate schools. One naval academy in Leningrad, the Order of Lenin Naval Academy, takes officers under the age of 36 who have served in the fleet between 6 and 10 years and trains them for senior staff appointments.

4. Logistics

The Soviet Union can build and repair all naval ship types in the naval inventory. Naval construction occurs in yards specializing in naval construction only and in yards constructing both naval and merchant ships. Current construction programs include six new classes of submarines, at least four of which are nuclear powered; newly designed and sophisticated cruisers and destroyers with increased ASW, antiair warfare, and extended-range cruising capabilities; escorts, submarine chasers, and guided missile patrol boats with improved capabilities; and modern submarine support auxiliaries to service the large submarine force.

Shipbuilding trends will continue within the decade of the 1970's with a further development of both multipurpose and strategic forces. Construction emphasis will remain with nuclear-powered ballistic missile submarines, nuclear attack submarines, major surface combatants and escorts, ASW platforms, and auxiliary support ships. Missile-equipped coastal defense boats and improved mine warfare and amphibious craft will continue to be built.

The Soviets have and will retain the capability to build and maintain their fleet at a level which meets their national requirements. In the event of mobilization, there is sufficient shipbuilding capacity to satisfy increased demands on the shipbuilding and repair industry.

5. Naval aviation

Soviet Naval Aviation (*Aviatsiya Voyenno-Morskogo Flota*), basically a land-based force, is an integral component of the Soviet Navy. Naval aviation has both tactical and strategic roles, but its primary mission is the destruction of hostile surface forces, with emphasis on the fast carrier strike force. Additional missions include maritime reconnaissance, antisubmarine warfare, destruction of enemy port facilities, protection of the seaward flanks of the ground forces from hostile surface forces, minelaying, and, under certain circumstances, support of amphibious operations.

Naval aviation crews are believed to be highly trained in air-to-surface missile attacks against hostile naval forces, and the acquisition of BEAR D aircraft has greatly increased the naval aviation reconnaissance capability. Additional emphasis in the field of antisubmarine warfare has been noted, but capabilities are still considered to be limited in offshore areas and negligible in the open ocean.

The fleet air forces are administratively subordinate to Headquarters, Soviet Naval Aviation, Moscow, through the Commander of Naval Aviation, who is a deputy of the Commander in Chief of the Navy. The four fleet air forces—Baltic Fleet Air Force, Black Sea Fleet Air Force, Northern Fleet Air Force, and the Pacific Fleet Air Force—are operationally subordinate to the respective fleet commanders.

Within the fleet areas the operational units are organized into divisions, regiments, and squadrons. While the division concept is evident in all fleets, the naval aviation organization is currently oriented toward independent units directly subordinate to the fleet headquarters, rather than to a division. The organization of a fleet air force headquarters is believed to parallel that of a tactical air army, and the headquarters of a fleet air division is probably similar to that of a tactical air army division.

As of 1 January 1971, the current combat aircraft strength of naval aviation is estimated at 972 aircraft, which are approximately evenly distributed among the four fleet air forces, but with some emphasis on the Northern and Pacific Fleet areas. The aircraft include 53 heavy reconnaissance BEAR D aircraft, 525 medium jet bombers, 60 light jet bombers, 87 seaplanes, 29 MAY ASW aircraft, and 218 helicopters. The BADGER C in naval aviation has a distinctive lip radome that houses a PUFF BALL radar; it carries one KIPPER (AS-2) missile (Figure 162). The light jet bomber, BEAGLE (Figure 163) is assigned in a bomber and utility role. The HOUND (Mi-4) helicopter (Figure 164) is employed in an antisubmarine warfare role.

There are, in addition, about 170 transport aircraft of various types assigned to the fleet air forces by Military Transport Aviation. There are an estimated 45,000 personnel assigned to naval aviation, of which 40,000 are in operational units and support elements, and 5,000 are at the Ministry of Defense level and in preoperational training.

D. Air forces ()

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The Soviet Air Forces²⁶ (*Voyenno-vozdushnyye Sily—VVS*) consist of Long Range Aviation, Tactical Aviation, Aviation of Air Defense, and Military Transport Aviation. These forces are being steadily modernized and have strong offensive and defensive capabilities.

Long Range Aviation (*Dal'naya Aviatsiya—LRA*) provides a strategic bombing capability for the air forces and also has a long-range armed reconnaissance mission. Bomber crews are believed to be highly proficient in all the basic aspects of strategic air operations: navigation; bombing; air-to-surface missile (ASM) strike procedures; staging; penetration tactics; employment of electronic countermeasures (ECM); and, for most heavy bomber crews, in-flight refueling. The total number of aircraft in the LRA bomber inventory

²⁶The term Soviet Air Forces used throughout this subsection does not include naval aviation, an integral part of the Soviet Navy.

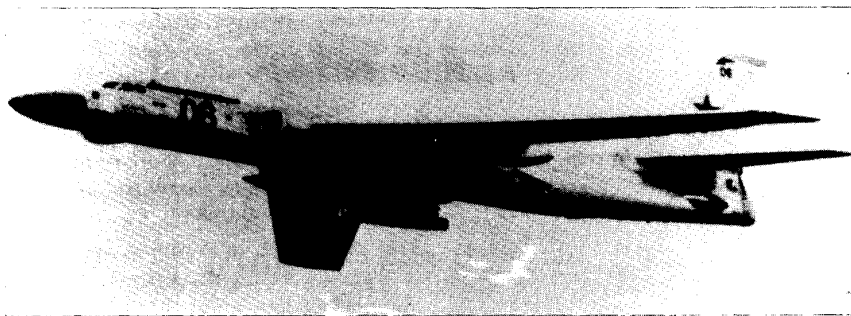


FIGURE 162. Soviet Naval Aviation
BADGER C with KIPPER missile

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FIGURE 163. BEAGLE used in Soviet Naval Aviation and
Soviet Tactical Aviation

has gradually decreased through BADGER attrition, but the BLINDER, BEAR, and BISON have remained fairly stable. The capabilities of the force, however, have been improved by the introduction of the supersonic-dash medium jet bomber BLINDER (free-fall bomber and ASM carrier), the acquisition of an in-flight refueling capability for about two-thirds of the BEAR force, the introduction of the 350-nautical-mile KANGAROO ASM into BEAR units and, more recently, the introduction of the 300-nautical-mile KITCHEN ASM into BLINDER units, and the development and assignment to BADGER units of the 120-nautical-mile KELT ASM. Figure 165 shows the LRA BEAR B aircraft. BISON (Figure 166), the jet heavy bomber, is assigned only to LRA. About 55% of the BADGER's (Figure 167) are in LRA; the remainder are assigned to naval aviation.

Tactical Aviation (*Frontovaya Aviatsiya*, literally Aviation of the *Front*) is a multipurpose force. Its mission is to provide counterair and close air support for ground forces and to support PVO *Strany* in strategic air defense. Its employment doctrine stresses mobility and flexibility. It has a good capability for both tactical strike and defensive operations with either conventional or nuclear weapons.

The overall strength of Tactical Aviation has increased by 600 aircraft since 1968. This buildup has been primarily along the Sino-Soviet border, including two Soviet fighter units in Mongolia. The increase consists mainly of older generation aircraft withdrawn from storage and assigned to operational units. There has also been a gradual increase throughout Tactical Aviation of new reconnaissance units equipped with



FIGURE 164. HOUND used in Soviet Naval Aviation and
Military Transport Aviation

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late-model aircraft. The reequipping of Tactical Aviation with current model aircraft is continuing but at a slow rate. Fighter aircraft include the FARMER (MiG-19), FISHBED (MiG-21) (Figure 168), FITTER (Su-7) (Figure 169), FRESCO (MiG-17), and a few FIREBAR (Yak-28P), and some FLOGGER. The light jet bomber force consists of subsonic BEAGLE (Il-28) and supersonic BREWER (Yak-28) aircraft (Figure 170). Reconnaissance is performed by MANGROVE (Yak-27) and by versions of the BEAGLE, BREWER, FISHBED, and FRESCO. All fighters can be employed in multipurpose roles, i.e., an air defense or ground-support role. About 55% of the fighters have an all-weather capability and are used primarily for air defense. Both the BEAGLE and the BREWER have an all-weather bombing capability, and both these aircraft can reach targets within a radius of about 500 nautical miles. At least four aircraft types (FISHBED, FITTER, BEAGLE, and BREWER) are capable of delivering nuclear weapons.

Aviation of Air Defense (*Aviatsiya Protivoyozdushnoy Oborony Strany*—APVO) is one of the three functional divisions of the PVO *Strany*. Its mission is to provide air defense of the U.S.S.R., especially for major population, industrial, and military centers.

About 50% of the APVO fighters are older models. About 75% have an all-weather capability, and most fighters can operate at altitudes up to 50,000 to 60,000 feet. Low-level intercept, however, is complicated by

FIGURE 165. Long Range Aviation BEAR B

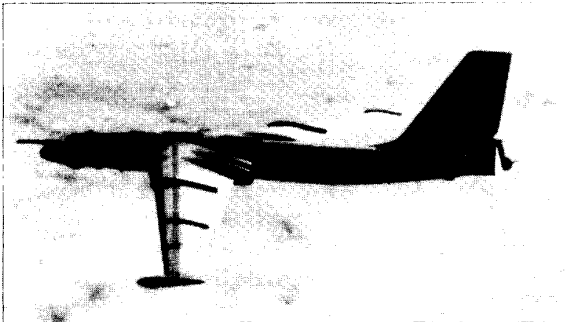


FIGURE 166. Long Range Aviation BISON B (

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FIGURE 167. BADGER A used in
Long Range Aviation and Soviet
Naval Aviation

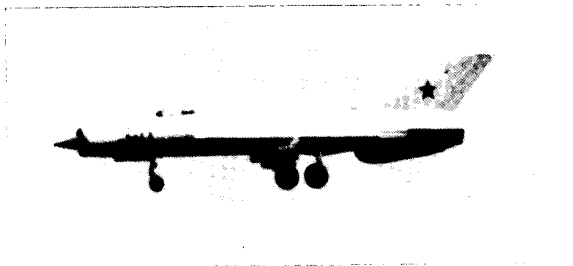
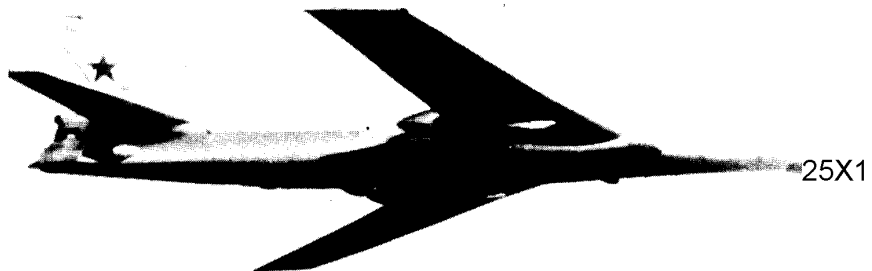


FIGURE 168. Tactical aviation FISHBED

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FIGURE 169. Tactical aviation FITTE



FIGURE 170. Tactical aviation BREWER

25X1

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relatively short ground-controlled-intercept ranges and the low endurance of interceptors. Some 350 interceptors (FIREBAR) in APVO probably have an intercept capability in all weather conditions down to 1,000 feet over favorable terrain and somewhat lower over water. In clear daylight the older interceptors would also be used against slower aircraft for low-altitude area intercept under visual conditions.

Military Transport Aviation (*Voyenno-transportnaya Aviatsiya*—VTA) is responsible for deploying men and materiel to meet war and near war requirements, and it operates an air logistic system to supply deployed forces and support other Soviet interests. VTA is committed to provide air transport support to long-range, tactical, air defense, and naval aviation; airborne troops; rocket troops; and special missions under the control of the Soviet Air Forces.

A major reequipment program which began in 1960 has provided VTA with CUB (An-12) medium turboprop assault transports and the Cock (An-22) heavy turboprop logistic transport. The CUB (Figure 171) can move men and materiel in close support of combat areas. Most of these have been used to reequip the element of VTA which supports airborne operations—VTA Central (VTA/CNT). One regiment, at Oranienburg, East Germany, is equipped with the CAMP (An-8). The CAMP (Figure 172), used for military logistic service and for parachute drop, can operate into and out of selected unimproved fields. The new long-range, four-engine heavy turboprop transport, the Cock, first displayed in June 1965, has now entered service in limited numbers. Cock (Figure 173) is a long-range heavy logistic carrier. This transport will provide a marked increase in airlift capabilities for VTA/CNT. The Cock fulfills a long-term Soviet requirement for a heavy transport capable of rapid, long-range delivery of troops and larger, heavier combat materiel than the CUB and CAMP can handle. Cock is capable of transporting almost any item of ground ordnance equipment, including heavy tanks, radar vans, and tactical missiles.

The VTA/CNT, using the CUB as prime carrier, can carry assault elements of two airborne divisions in a parachute drop or airdropped operation to a distance of 760 to 900 nautical miles, or it can transport a division with all equipment in a ferry lift operation to a distance of 1,400 nautical miles. Augmentation of this capability can be provided within limits by the civil air fleet. The CUB's assigned to the civil air fleet are equal to three full-strength transport regiments. Other assigned civil transports could be useful in an initial attack. In addition to transport aircraft, the VTA is assigned various models of helicopters. The Hook (Mi-6) (Figure 174) is a heavy transport helicopter. The HTP (Mi-8) (Figure 175), a large single-rotor helicopter, has appeared in VTA.

Military Transport Aviation is a service organization and, as such, is fragmented into transport units deployed to various force commanders of the Soviet Air Forces. The force commanders assume immediate

operational control of assigned transport units. Overall operational and administrative control is retained by the VTA commander which allows him to recall or reallocate transports as necessary.

The operational chain of command of the VTA flows from the Ministry of Defense to the Commander in Chief, VTA. The major element of the VTA is VTA/CNT which supports airborne troops and performs other logistic support as required. VTA retains operational and administrative control of this unit.

1. Organization

The Commander in Chief of Soviet Air Forces, a Marshal of Aviation, is one of the five Deputy Ministers of Defense, a member of the Party Central Committee, and probably of the Higher Military Council. As a member of the high command, he is believed to participate in the planning and development of strategy for employment of the air forces in conjunction with other force components and, in this capacity, to participate in the issuance of broad operational directives to the air forces.

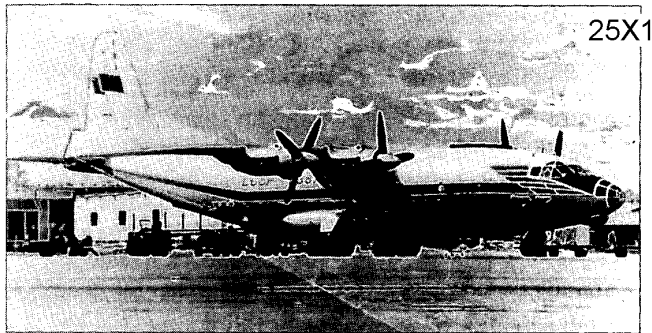
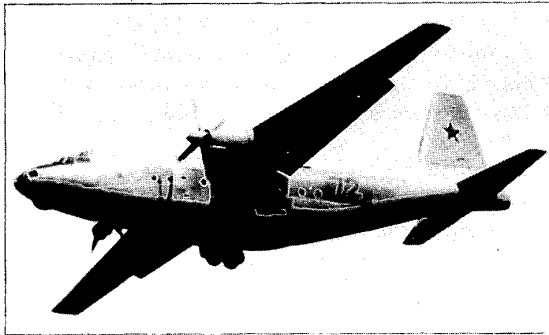
The Commander in Chief of Soviet Air Forces provides overall supervision of the component forces in matters relating to doctrine, organization, training, manpower, and logistics. He is assisted by a first deputy commander; three deputy commanders for combat training, aviation engineering services, and rear services; the chief of the air forces main staff; and the commanders of Long Range Aviation, Aviation of Air Defense, and Military Transport Aviation. A subordinate commander for Tactical Aviation has not been identified. Administrative functions related to tactical aviation probably are provided by the air forces main staff and a number of specialized directorates within the air force headquarters. One of these is the Military Council of the Air Forces, believed to be an agency of the Communist Party, within the Ministry of Defense.

Long Range Aviation is divided by geographic area into three long-range air armies, each of which is organized into medium bomber and heavy bomber regiments. This command is under the operational control of the Minister of Defense; administrative control is exercised by the Commander in Chief of the Soviet Air Forces. The organization of LRA headquarters is similar to that of air forces headquarters, but on a reduced scale.

Tactical Aviation is organized into 16 air armies. Tactical air armies are a component of military forces comprising unified or integrated commands assigned to military districts within the U.S.S.R. and to Soviet groups of forces outside the country. The size and composition of each tactical air formation varies according to need.

The organization of the systems for command and control of operations of Tactical Aviation appears well defined. The chain of operational command is from the Ministry of Defense to commanders of military districts, or groups of forces, to which air armies at the field level

FIGURE 171. Military Transport Aviation CU



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FIGURE 172. Military Transport Aviation CAMP



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FIGURE 173. Military Transport Aviation COCK



FIGURE 174. Military Transport Aviation HOOK

25X1



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FIGURE 175. Military Transport Aviation HIP

are operationally subordinate. The Commander in Chief of Soviet Air Forces, as a ranking member of the high command at the ministry level, is almost certainly included in the operational planning and strategic direction of tactical air armies.

At the field level, commanders of air armies are believed to be deputies for aviation to the military district, group of forces, or, in wartime, *front* commands. While coordination of weapons systems is provided in these territorial areas through a joint command and control structure, the operational control and employment of aircraft is retained by commanders

of air armies so as to insure appropriate utilization of aircraft capabilities and to provide mobility and flexibility in employment.

For the strategic air defense function, certain fighter elements of Tactical Aviation respond to orders of the Commander of Soviet Air Defense Forces (*PVO Strany*) or his subordinate commanders in air defense territorial areas in which the tactical air elements are located.

In the Soviet-occupied area of East Germany there is a modified command structure for controlling fighter aircraft, principally in an air defense situation. Here northern and southern corps echelons of command have

been introduced. This refinement in control authority in a theater-type deployment of Tactical Aviation enhances versatility in employment of fighter aircraft. Additionally, it defines more precisely the areas of responsibility in a weapons-saturated environment and may serve as a medium for integrating operations of weapons systems performing an air defense function.

Aviation of Air Defense is subordinate to PVO *Strany* headquarters near Moscow. The deputy for APVO is responsible to the PVO *Strany* commander for the deployment and employment of fighter units and establishes fighter interception procedures for all fighter aircraft, including fighters in Tactical Aviation when needed for air defense purposes.

The operational chain of command of Military Transport Aviation is from the Minister of Defense to the commander of the VTA. Transport units and their operational control are allocated to commanders of force components by the commander of the VTA for normal air support roles, but he retains overall control and can withdraw or reassign aircraft as necessary for emergency or priority tasks.

2. Strength, composition, and disposition²⁷

The Soviet Air Forces have about 510,000 personnel and over 11,100 combat and support aircraft, including helicopters, in operational units. Of the personnel, 416,000 are in operational units and support elements of the several forces (including 133,000 in the air defense forces), and 94,000 are in high command in general support, including Ministry of Defense, research and development, and preoperational training.

As of 1 July 1971, Long Range Aviation, with an operational personnel strength of 58,000, consisted of 910 bombers and tankers deployed on 27 airfields and organized into 28 medium bomber regiments and 10 heavy bomber regiments in three air armies. The 1st Long Range Air Army encompasses the northwestern part of the U.S.S.R., the 2d Long Range Air Army is in the southwestern portion of the country, and the 3d Long Range Air Army is located in the far eastern U.S.S.R.

Tactical Aviation consists of over 4,000 combat aircraft organized into about 100 regiments. It has some 125,000 personnel assigned to operational units and support elements. Approximately 5,600 pilots are assigned to operational units. An estimated 35% of total personnel are assigned to the air armies in groups of Soviet forces in Czechoslovakia, East Germany, Hungary, and Poland. Approximately 24,000 are assigned to the 24th Tactical Air Army in East Germany. There are 12 air armies in the military districts of the U.S.S.R.

Aviation of Air Defense has about 95,000 personnel in operational units and support elements. Combat fighter aircraft total about 3,220 in 93 regiments. About 50% of

these fighters are late models; about 75% of the force have an all-weather capability.

Military Transport Aviation has approximately 100,000 personnel assigned to its operational units and support elements. Total aircraft strength is about 2,945.

The Soviet air facilities²⁸ system consists of some 3,100 airfields and 15 seaplane stations. About 522 airfields have permanent-surface runways, and 458 airfields have runways which exceed 8,000 feet. Military seaplanes use only six seaplane stations, and the principal airfields used by military aircraft number about 300.

In general the Soviet Union and the Eastern European Communist countries each have an adequate well-distributed air facilities system capable of supporting all types of air operations. Construction activity suggests that a continuing military airfield construction program is considered necessary both to accommodate newer aircraft and to provide a more desirable deployment or dispersal capability.

3. Training

a. PREOPERATIONAL—With the reduction in term of service for aviation personnel effected by the 1967 Universal Military Service Law, preconscription elementary military training has become compulsory. Training is to begin when youths have reached 17 years of age. It is planned that this training will be done without detaching the individuals from their studies or work.

The training is to be accomplished in the general-education schools starting with the ninth grade, in secondary specialized teaching institutions, and in the teaching institutions of the vocational-technical education systems. It is to be directed by the Ministry of Defense and DOSAAF. Training is expected to emphasize vocations and technical specialties similar to certain special military qualifications.

For personnel assigned to the air forces, the postinduction period of training will necessarily provide more selective, specialized, and professional training, primarily for those who elect to become careerists. There are aviation technical schools, engineering academies, a higher navigator school, and about eight schools which provide preoperational pilot training.

Pilot training during peacetime is of about 4 years' duration. The ground training portion includes studies in mathematics, physics and aerodynamics, chemistry, languages, history, physical education, and Communist Party history. Flight training and related exercises in parachute jumps, strafing, bombing, and air-to-air interception (simulation) begin in the first year. An estimated 250 hours of flight training is provided.

Long Range Aviation trainees are probably specially selected on the basis of aptitude, and their practical

²⁷For current details on order of battle for all Soviet Air Forces see *Soviet Aircraft Order of Battle* (AP-240-2-4 series), published quarterly by the Defense Intelligence Agency.

²⁸For current information see Volumes 33-39 of *Airfields and Seaplane Stations of the World*, published by the Defense Intelligence Agency. Details on Soviet air facilities are provided in 3. Transportation and Telecommunications in this General Survey.

training emphasizes formation flying, navigation, and bombing practice. Total preoperational flying time may average 300 to 400 hours per crew.

b. OPERATIONAL—Combat training of LRA aircrews is accomplished within the operational units as a part of the normal training program. All units are expected to maintain a relatively high standard of operational preparedness. The unit training program covers 12 months of the year, but the individual crew members actually spend 10 months on their flying duties annually; 1 month each is spent on leave and on political and administrative obligations. It is estimated that LRA operational crew training has progressed to a high state of proficiency.

The annual training program of Tactical Aviation includes all-weather flying, formation, air-to-air combat, rocketry, bombing, gunnery, reconnaissance, and deployment exercises. The daily combat readiness of the air units is a continual program, with the units maintaining varying degrees of alert posture according to assignment. The climax of unit training is a series of extensive maneuvers carried out at military district or groups of forces levels in cooperation with the ground forces. These maneuvers are usually held in the fall.

Operational training for Aviation of Air Defense, in addition to the invaluable training gained from actual scrambles and intercepts of peripheral non-Soviet flights of various kinds, includes a training cycle in which the training exercises for the year begin in February or March. Local joint exercises in spring maneuvers usually provide some fighter training in air-ground coordination. Summer months are used to fulfill the assigned syllabus, with heavy air activity during favorable weather. Training culminates in the fall of each year with large-scale joint maneuvers with other air units and ground or naval forces. The operational training program is very detailed and designed to take maximum advantage of the limited flight time available.

Pilots assigned to operational units of APVO have been checked out in jet fighter aircraft. Operational units are responsible for developing and maintaining operational flight proficiency, and training includes formation flying and high-altitude flights. The introduction of airborne intercept radar into operational units has resulted in important changes in operational training procedures. Air intercept training includes interception techniques involving the various components of the air defense system. Practice alerts and ground-controlled interceptions are staged regularly, as well as actual intercepts of unidentified aircraft. Air defense training includes realistic practice in high-speed air-to-air gunnery, rocketry, and missile firing with ground-controlled-intercept and airborne radar aids. Training in all-weather operations is conducted either in operational units or in special all-weather training schools.

Operational training in Military Transport Aviation is accomplished after officers and crews are integrated into their units. Proficiency in flying transport aircraft

through all conditions of weather is acquired under actual flight conditions—instrument training flights in heavy overcast and winter night flights from airfields covered with snow and from icy runways. It can be assumed that tactical paratroop drops by squadron are part of the routine training. There is evidence that, weather permitting, field training exercises in conjunction with airborne troops continue throughout the year. Crews receive extensive briefing before an operation, and postoperation analysis of errors is conducted.

There is evidence that cross-training in heavy transports and helicopters is a requisite for commanders. Commanders are trained for positions one step higher than that which they occupy, so that replacements are always available. It is probable that older combat pilots from fighter and bomber units, after retraining, are transferred to transport aviation.

Enlisted technicians in operational and maintenance units are given on-the-job training or attend special schools which give 1½- to 2-year courses of intensive theoretical and practical training. Technical officers are assigned to operational units after graduation from technical officer candidate schools. These schools provide 3-year courses with specialization in such fields as special equipment, electronics, instruments, aircraft engines, and armament.

Advanced training for officers is accomplished through a number of higher staff schools and academies. These include Lipetsk Air Tactical School, Advanced Officer School, Advanced Navigation School, and the two major air academies—the Military Air Academy and the Zhukovskiy Air Engineering Academy.

4. Logistics

Rigorous planning is required in determining the Soviet Air Forces materiel requirements, and these requirements are then integrated into the overall economic plan. Top-level control and planning for logistics is a primary responsibility of the Directorate of the Rear of the Air Forces. Upon final approval of logistic requirements by the Ministry of Defense, the directorate procures items peculiar to air components, with the exception of complete aircraft. Orders for aircraft are placed by the Directorate of Aviation Engineering Services. Common-use items are procured at the Ministry of Defense level for all services and distributed through the military districts.

An essential element of the supply system is an extensive network of depots for storage of technical supplies, fuel, ammunition, and so forth. Air forces depots are established at several echelons: headquarters of the air forces, air army, military district, and airfield. The lowest supply and servicing echelon of the air forces rear services, the air technical battalion, is assigned to each operational airfield and performs the functions required to maintain both the airfield and the air unit occupying it.

For distribution of aircraft replacement parts, the Soviets rely heavily on a system whereby spare parts kits are provided with each aircraft delivered from the factory. These kits include all spares and special tools required for normal maintenance purposes up to overhaul, at which time the kits are reissued. Individual item requisitions are thus limited to replacing only those parts that fail, malfunction, or are damaged before the expiration of their guaranteed service life.

Maintenance and repair of aircraft and related equipment are the responsibility of the Directorate of Aviation Engineering Services. This technical organization is structured all the way from the producing factory to the operational air regiment through a chain of chief maintenance engineers and their staffs at each command echelon. The directorate requisitions complete aircraft, orders technical replacement parts (through the regular supply channel), operates the aircraft maintenance shops, controls the aircraft maintenance organizations, and prepares and issues the technical manuals for aircraft maintenance and repair.

The Soviets employ essentially two levels of maintenance—field maintenance and major repairs. Field maintenance compares with U.S. Air Force organizational maintenance, consisting of accomplishing the inspection cycles and finding minor deficiencies and making the necessary repairs. Field maintenance responsibility rests directly at regimental level and the work is performed by squadron mechanics and regimental specialists in electronics, armament, engines, and hydraulic systems. Major repairs and overhauls are accomplished at aircraft repair bases, under the control of the air army. As an adjunct to both levels of maintenance, the Soviets use factory teams which instruct unit maintenance personnel during the initial phases of new equipment introduction, perform modifications in the field, and correct problems in which cause factors are traced to the manufacturer.

The Soviets provide adequate peacetime logistic support for their flying units. They are believed to have the capability to provide effective logistic support for their flying units under wartime conditions.

The logistic system depends principally for effectiveness on the accurate estimation of future requirements and the stockpiling of aviation technical supplies in suitable locations for satisfying the anticipated materiel demand. In accordance with this policy, the Soviets have stored large stocks of aviation technical supplies as wartime reserves in many depots located in the peripheral areas of the U.S.S.R.

The aircraft maintenance and repair system provides effective support in peacetime for flying units to complete combat flight training schedules and to conduct mobility and deployment exercises. Flying units generally achieve high serviceability rates and are maintained at a high state of combat readiness. Aircraft and related equipment also are reported to be highly reliable, which is an indicator of effective maintenance support, as well as good design and production qualities.

Field maintenance organizations frequently perform maintenance work on aircraft parked out in the open. Maintenance technicians and specialists are trained to accomplish their duties with the use of only mobile or portable tools and ground-support equipment. Field maintenance organizations are accordingly capable of quickly moving to other airfields without degrading their effectiveness.

E. Air defense forces ()

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Soviet Air Defense Forces (PVO *Strany*) is charged with the strategic air defense of the U.S.S.R. The destruction of intruding aircraft, missiles, and other weapons while airborne is the specific mission of this force. The system consists of fighter aircraft, aircraft control and warning radar, and surface-to-air missiles. Streamlining of the PVO *Strany* organization and improved efficient means of handling air defense data have insured more command and control of the air defense system. However, despite continuing improvements, the system would have great difficulty in coping with large-scale air attacks employing a variety of weapons and sophisticated tactics. The capability to intercept aircraft and air-to-surface missiles flying at low altitudes declines with the altitude, and at very low altitudes is limited by the line-of-sight coverage of ground radars and by the difficulty of tracking a target and interceptor through ground clutter. Generally, in the western U.S.S.R. and the approaches to major military industrial centers, the air surveillance network is capable of maintaining a continuous track on aircraft flying down to about 1,000 feet. Some specially mounted radars may give a tracking capability down to 500 feet or less. In areas of less dense coverage, Soviet radars are unlikely to be able to accomplish continuous tracking below 3,000 feet.

1. Organization

PVO *Strany*, an operational and administrative command, implements coordinated air defense plans involving all appropriate elements of the armed forces and supervises operational training and effectiveness. PVO *Strany* headquarters includes offices for administration, political affairs, personnel, research and development, probably training, and a main staff; their precise organizational status is not known. There is also a military council, probably for the development of plans and policies, which apparently consists of the commander in chief and his deputies. PVO *Strany* is functionally divided into fighter aviation, air warning and control, and surface-to-air missiles, with a deputy and headquarters staff for each element. A fourth element, Antimissile Troops (PRO), which is responsible for antimissile defense, is believed to be a part of PVO *Strany*, but its exact status is unknown.

Territorially, the U.S.S.R. is divided into 10 air defense districts, which are subdivided into zones and sectors. District commanders coordinate air defense operations, but weapons are assigned at lower levels.

2. Strength, composition, and disposition²⁹

There are about 482,000 persons in the air defense forces. Of this number about 95,000 are in Aviation of Air Defense, 87,000 in air control and warning radar, and 300,000 in the SAM system.

There are about 3,220 interceptors in Aviation of Air Defense concentrated mainly in the European U.S.S.R., although large numbers of fighters are deployed in industrial and military areas throughout the U.S.S.R. Most of the FIREBAR aircraft (Yak-28) (Figure 176) are assigned to APVO. The long-range interceptor, FIDDLER (Tu-28), is operational in the Moscow, Northern, and Trans-Siberian air defense districts. The short-range interceptor, FLAGON A (Figure 177), is operational in all air defense districts except the Northern and Trans-Siberian. An airborne warning and control aircraft, Moss, is employed in limited numbers over water and in conjunction with long-range interceptors. In the U.S.S.R., most of the FARMER (MiG-19) day and all-weather fighters (Figure 178) are in APVO. FRESCO (MiG-17) (Figure 179), in both the day fighter and the all-weather fighter versions, is assigned in large numbers to APVO.

²⁹For current information see *Soviet Aircraft Order of Battle* (AP-240-2-4 series), published by the Defense Intelligence Agency.

Four SAM systems provide air defense protection of vital areas within the U.S.S.R. The SA-1 (GUILD) is deployed only in the Moscow area, where there are 56 sites. There are about 1,160 SA-2 (GUIDELINE) sites in the U.S.S.R., of which about 760 are believed to be occupied on a more or less permanent basis. The SA-2 (Figure 180) is widely deployed in the Soviet Union, Eastern European Communist countries, and other Communist and non-Communist nations. There are about 289 SA-3 (GoA) sites, in the U.S.S.R., of which about 205 are believed to be occupied on a more or less permanent basis. The SA-5 (GAMMON) system is deployed at about 79 complexes (a complex may consist of from two to five firing sites). About 58 of these complexes are believed to be operational, with 21 under construction. The system is a long-range high-performance SAM, deployed to counter a high-speed, high-altitude aerodynamic threat, and is considered unlikely to have an ABM role, although this possibility cannot be excluded. Evidence has been available for several years that the Soviets have been developing antimissile-missile systems. The ABM-1 (GALOSH) antiballistic-missile system (Figure 181) is being deployed around Moscow and furnishes a limited defense of the Moscow area.

There are some 3,100 to 4,100 ACW radar sets deployed in about 1,000 sites within the 10 air defense



FIGURE 176. Aviation of Air Defense FIREBAR

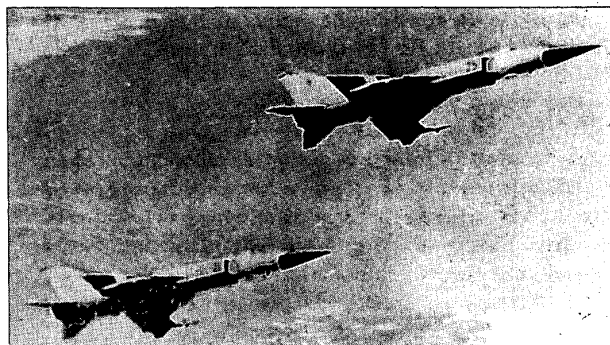


FIGURE 177. Aviation of Air Defense FLAGON A (C)



FIGURE 178. FARMER, employed in Aviation of Air Defense and in Soviet Tactical Aviation

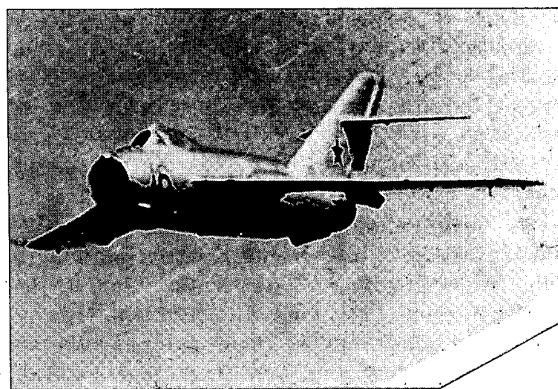


FIGURE 179. FRESCO, employed in Aviation of Air Defense and in Soviet Tactical Aviation

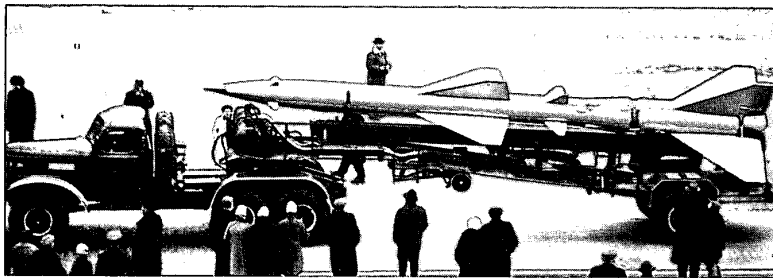


FIGURE 180. GUIDELINE (SA-2) surface-to-air missile

25X1

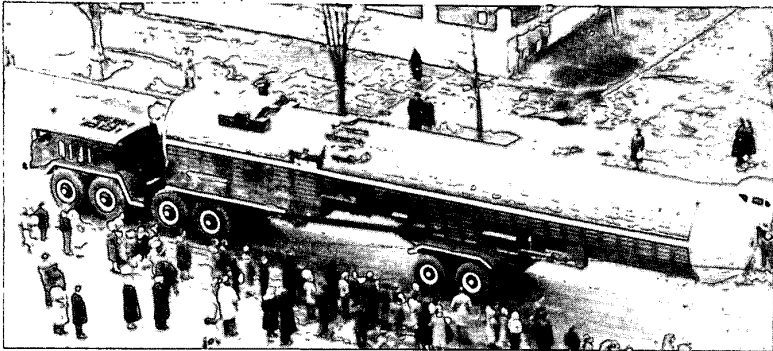


FIGURE 181. GALOSH (ABM-1) anti-ballistic missile

25X1

districts of the U.S.S.R. TALL KING (Figure 182) is a permanently mounted, high-powered early warning radar. The BAR LOCK is the most capable early warning radar in the Soviet inventory except for TALL KING; when collocated with height finders such as SIDE NET it functions in a ground-controlled interception role (Figure 183).

3. Training

Operational training aims at the effective integration of the various components and other contributing forces into the overall system. Training emphasizes practice in the specialized procedure of the particular components as well as exercises involving the overall system.

4. Logistics

The various components—aircraft, surface-to-air missiles, ACW radar—that make up the air defense system are supported by the Chief of the Rear and by the parent organization, i.e., aircraft by the Soviet Air Forces, surface-to-air missiles by the Soviet Ground Forces, and ACW radar by both ground and air forces, since members of both services are employed in this field.

F. Rocket troops

The Soviet Strategic Rocket Troops (*Raketnyye voyska Strategicheskogo Naznacheniya*) constitute the main strategic striking force of the U.S.S.R. The primary mission of this force is to destroy the enemy's means of nuclear attack, main governmental and military control centers, and important industrial concentrations. Constituted in 1960 as a separate force on a command level with ground, navy, air, and air defense forces, the Strategic Rocket Troops function as

one of the instruments in support of Soviet foreign policy, form the main deterrent force, and enable the Soviets to employ the element of maximum surprise in intercontinental strikes.

1. Organization

The Commander in Chief of the Strategic Rocket Troops is responsible for the organization and administration of the organic forces and weapons systems of the command and for implementing operational policy formulated by higher authority. Marshal N. I. Krylov is Commander in Chief of the Strategic Rocket Troops (Figure 184). The headquarters probably consists of the commander, a main staff, and directorates for political affairs; engineering; inspection; rear services; equipment, including technical services and special armament; and combat training.

The Main Staff develops operational plans for the Commander in Chief of the Strategic Rocket Troops. It includes sections for planning and operations, intelligence, budget and fiscal, personnel and mobilization, communications, and transportation. The Political Directorate, subordinate to the Main Political Directorate of the Soviet Army and Navy, is responsible for the orientation and indoctrination of rocket troops in Communist ideology. Its control is projected downward through subordinate echelons. The Chief Engineering Directorate is probably responsible for supervision and coordination of launch site construction and maintenance. The Chief Inspectorate administers the inspection system and monitors all aspects of combat readiness and efficiency of the Strategic Rocket Troops to insure compliance with directives. The Rear Services Directorate of the Strategic Rocket Troops probably

25X1

FIGURE 182. TALL KING early warning radar

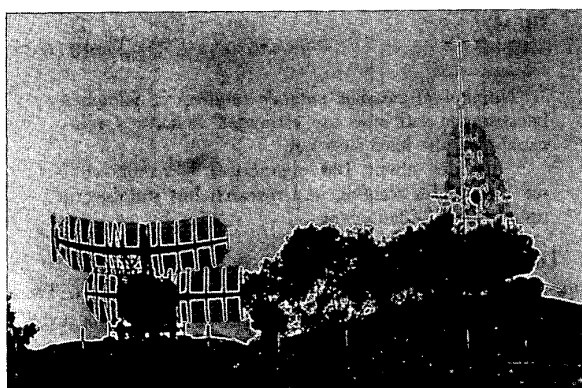
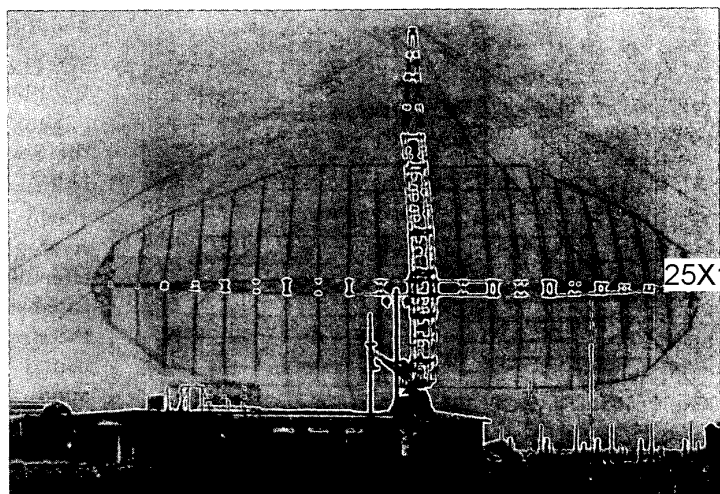


FIGURE 183. BAR LOCK early warning radar (left) and SIDE NET height-finder radar

FIGURE 184. Marshal N. I. Krylov,
Commander in Chief, Strategic
Rocket Troops25X1
25X1

performs functions similar to those of its counterpart at the Ministry of Defense level, administering the procurement and distribution of common-use items, probably through several depots conveniently located with respect to the deployed forces.

The Missile Troop Equipment Directorate is unique to the Strategic Rocket Troops. In addition to the management of items in the strategic missile inventory, it also controls all associated ground-support equipment, as well as components and maintenance parts. Its responsibility with respect to strategic missiles is comparable to that of the Main Missile and Artillery Directorate with respect to tactical missiles. Coordination between the Missile Troop Equipment Directorate and the Main Missile and Artillery Directorate is effected at the Ministry of Defense level. It is probable that the Special Armaments Service, which is the supply channel for equipment and maintenance down to battalion level, is subordinate to the Missile Troop Equipment Directorate.

The Chief Directorate for Combat Training is responsible for setting standards of technical training and combat efficiency of troops, including live training

exercises at the range. It supervises implementation of the annual training plan in all headquarters, units, and installations, including a number of combat training schools. Final responsibility for troop training, however, is at the regimental level.

ICBM operational units are located at 24 launch complexes, widely deployed along major railroad systems from the Moscow-Leningrad area to the Far East. In addition, there are some operational units at the Plesetsk and Tyuratam missile test centers. Each complex is considered to be a division, and may be operationally subordinate to Strategic Rocket Troops. Army or independent corps echelons are believed to exist, primarily for administrative purposes.

Each complex (division) controls its subordinate units (regiments, possibly, and battalions and batteries) and provides the fundamental administrative and house-keeping services basic to a parent unit. At soft complexes or parts thereof, each launch pad is probably of battery level; each two-pad soft launch site probably constitutes a battalion. Echelons at hard complexes or

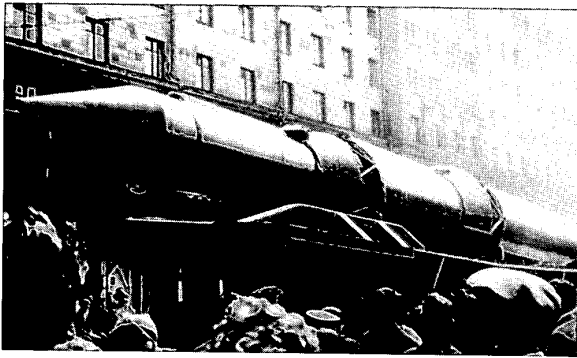


FIGURE 185. SAVAGE (SS-13) intercontinental ballistic missile

parts well defined. The SS-13 (SAVAGE) intercontinental ballistic missile is shown in Figure 185; this missile is among the types currently being deployed.

The IRBM and MRBM force is organized into missile armies, divisions, regiments, battalions, and batteries. Each launch pad is believed to be of battery level. A complex of two or three IRBM or MRBM sites comprises a regiment which is considered the basic command unit or field launching authority under the direct operational control of Strategic Rocket Troops headquarters at Moscow. The variable-range ballistic missile (VRBM) SS-11 deployed at IRBM and MRBM complexes is believed to be deployed in groups of 10 sites as the basic firing unit. Regimental composition for this segment of the force has not been identified. Battalions and batteries function as component parts of the regimental command and are completely under regimental control. The role of the IRBM and MRBM armies and division headquarters appears to be primarily coordination of administration, planning, supply, and training. However, in the event of an alert or actual launch of missiles, these intermediate commands may also perform an operational role in that they authenticate alert and launch orders from Strategic Rocket Troops headquarters and serve as centers for assessment and evaluation of the launch units' accomplishments and current status.

The relationship of the strategic missile units to the long-established military district system is similar to that of units of other components of the armed forces. While the launch units are operationally subordinate to the Minister of Defense through headquarters of the Strategic Rocket Troops, the military district commanders function in special administrative and supply roles, such as procurement and warehousing of common-use supplies and equipment. In addition, Strategic Rocket Troops units with appropriate weapons systems might be called upon, in certain circumstances, by military district commanders to render support.

2. Strength, composition, and disposition

The personnel strength of the Strategic Rocket Troops has increased steadily since its creation as a separate force in 1960. Total personnel strength is believed to be

about 375,500, of whom some 300,500 are assigned to operational units, with the remainder in support and training roles.

Since the inception of the Strategic Rocket Troops, the Soviets have developed and deployed a family of ballistic missiles capable of reaching any potential enemy. The U.S.S.R. now has four categories of strategic ballistic missiles—intercontinental with effective ranges of 2,500 to 6,500 nautical miles, ICBM's capable of ranges from 500 to 6,000 nautical miles and therefore capable of either peripheral or intercontinental attack, intermediate with effective ranges of approximately 2,000 nautical miles, and the medium with ranges up to about 1,000 nautical miles. Operational strength in these missiles as of 1 January 1971 is estimated as follows:

TYPE	MISSILES	LAUNCHERS
ICBM	*1,625	**1,475
VRBM	120	120
IRBM	130	90
MRBM	*930	510

*Number of missiles exceeds number of launchers because the soft sites are estimated to have a refire capability, the hard sites not.

**Includes about 100 operational launchers ordinarily used for training and research but suitable for military missile launching.

To date, ICBM deployment has been limited to 24 operational launch complexes within the U.S.S.R. Thus far there is no indication that deployment of this system extends beyond the reaches of rail system support. About 95% of the VRBM (two launch complexes), IRBM, and MRBM force has been deployed in western U.S.S.R., with lesser concentrations in the southern U.S.S.R. Hardened launchers constitute about 90% of the operational ICBM force and about 25% of the VRBM, IRBM, and MRBM force.

3. Training

The Strategic Rocket Troops training program emphasizes both individual and unit training. Although a number of schools and training centers are utilized, final training responsibility appears to be focused on the regimental and battalion level of combat units. Cadre training, by which experienced personnel impart learned skills to the recruits, is also emphasized.

Preliminary preservice training has been utilized to the greatest possible extent in securing the best qualified personnel. Graduates of military secondary schools are frequently brought into missile units. Other recruits are obtained from artillery academies, air forces technical training academies, engineering and command schools, and the DOSAAF organization. In addition, the Strategic Rocket Troops are receiving an increasing number of recruits who have completed secondary school ROTC-type programs, which have been expanded to include additional technical training.

Officer training for the Strategic Rocket Troops is carried out primarily at the Dzhershinskiy Missile

25X1

Engineering Academy, which is under the direct supervision of the Commander in Chief of the Strategic Rocket Troops. The enrollment at this academy is approximately 2,500, and graduating classes number from 450 to 600. Two courses are offered at this academy—a short course of 9 to 12 months, and one of 5 ½ years. Selected graduates from the first course are chosen to attend the second. Most graduates of the academy are assigned to the Strategic Rocket Troops, although some go to ground forces tactical missile units. Some graduates of the Artillery Command Academy in Leningrad go to the Strategic Rocket Troops, although this academy is mainly concerned with the training of tactical missile technical officers.

An unknown number of enlisted personnel assigned to the Strategic Rocket Troops are selected for specialized training and attend programs of instruction at military engineering and artillery schools. Courses in armament, instrumentation, electronics, and engine and airframe maintenance, varying in length from 6 to 18 months, are given these enlisted personnel. In addition to schools, enlisted specialists are sometimes detailed to missile factories for specialized technical training.

Unit training occupies an important role in the missile forces. In fact, for most of the rocket troops unit training under experienced officers and noncommissioned officers probably provides the greatest percentage of training. In the Strategic Rocket Troops the period between the original assignment of a unit's cadre until the deployment of the unit at full strength may last as long as a year. After a unit has been activated, it begins a training cycle known as integrated weapons system training. During this period personnel qualified in individual specialties are combined and trained as a unit in the sequential duties necessary to launch a ballistic missile. This training is conducted at special training bases, missile test ranges, or operational sites. Actual missile launchings are probably not mandatory as part of this program. As units develop a high degree of competence they participate in exercises in order to perfect the methods and skills required in deploying ground equipment, preparing it for operation, and launching missiles. Certain of these training exercises include actual launch operations. Another feature of unit training is combat support operations, including training of personnel in guarding missile sites against sabotage and agent penetration.

Since its inception in 1947, the Kapustin Yar Missile Test Range has been the scene of missile training activity for missiles of less than intercontinental range. Actual firings of missiles include those by operational units returning to the range for "confidence firings."

Crew training of ICBM personnel is conducted at the Tyuratam missile test center and at the Plesetsk missile and space center, at various special training centers, and at the operational missile sites.

Before an operational rocket troops unit can enter combat duty it must be certified as operationally ready by meeting a specified level of proficiency as determined by an evaluation group responsible to the

commander in chief. Once a crew has been certified as capable of performing its combat mission, it may be assigned to perform an actual proficiency firing. In some instances operational units conduct live launchings from their home bases.

4. Logistics

Logistic functions of the Strategic Rocket Troops are the responsibility of the Missile Troop Equipment Directorate. However, actual fabrication of missiles and components is accomplished at plants under the direction of the Ministry for Defense Industry.

ICBM complexes are believed to contain a division supply depot while IRBM and MRBM complexes contain a regimental-level supply depot, each complete with large reserve stocks of supplies for support of launch sites.

Responsibility for supply and maintenance of launch units is believed to be divided among several organizations. Special Armament Service personnel are responsible for the supply and maintenance of missiles and associated equipment except the reentry vehicle and warhead. They are assigned to all echelons down to battalion. They operate the inspection and maintenance vehicle station, a facility capable of field and unit-type maintenance on specialized missile-handling equipment, and provide on-the-job training to launch crews on utilization of equipment and minor maintenance.

Repair Technical Base personnel—attached to operational launch units—supply, maintain, and assemble reentry vehicles, including nuclear warheads. Committee for State Security (KGB) personnel retain security control over nuclear warheads.

Technical Services personnel, under the administrative and technical control of the Central Motor Vehicle-Tractor Directorate, Ministry of Defense, are responsible for the procurement and maintenance of heavy equipment, including all types of rigging, cranes, and construction equipment, but excluding missile transporters and special propellant carriers.

The Engineering Directorate has responsibility for the installation and maintenance of launch and control equipment and for auxiliary facilities.

A deputy commander for the rear at each echelon down to regiment is responsible for the procurement, storage, supply, and transportation of quartermaster and medical supplies.

The Soviets depend primarily on their rail system to support their strategic launch complexes, on a complex-by-complex basis. Air transport serves in a backup and emergency support role.

Supply and maintenance echelons in the Strategic Rocket Troops are believed to go down to battalion level. At the regimental level after the missile has been inspected, assembled, and checked by the Special Armament Service, and a reentry vehicle has been attached under the direction of Repair Technical Base personnel, responsibility for keeping the weapon serviceable belongs to the launch battery. It is believed

that when maintenance problems arise which cannot be handled by the Special Armament Service and the Repair Technical Base, the components involved are shipped back to repair plants under the control of the Missile Troop Equipment Directorate.

Maintenance personnel usually are selected for assignment to a strategic missile organization after completion of an initial training period at a service-connected secondary technical school. Within operational missile launch complexes, it is believed that there are unit schools for the special training of personnel, and that the everyday work of subunits is constituted in large part in the operation of missile equipment.

It has been demonstrated that the Soviet Union has the capacity in many technological fields to produce original and advanced designs. A strong tendency to go along with proven equipment also is apparent. As a result, specifications on many items in the U.S.S.R. are more uniform than in the United States. Furthermore, the Soviets produce simple and often more rugged equipment than that used in the United States, leading to more simplified maintenance procedures.

The supply and maintenance programs within the Strategic Rocket Troops are characterized by highly centralized organizational control and rigidly defined duties and responsibilities. The tightly knit organization enables the Soviets to direct priority support and distribution of essential materials, as warranted, in the development of their strategic missile force. From the Soviet point of view the supply and maintenance systems are capable of performing the tasks assigned.

G. Militarized security forces

The security forces constitute a force of an estimated 250,000 men. These forces are divided into two major groups—Soviet Frontier Troops, estimated at 175,000, and Soviet Interior Troops, estimated at 75,000.

Enlisted personnel are conscripted on the same basis as personnel for the army and the navy. At the annual callup, security troop officers sit with the local draft board and select conscripts for the security troops. Selection is made after consideration of political reliability, social background, education, and general physical health. This selection and the subsequent training provide a force composed of troops who are well prepared for their specific tasks, reliable, and devoted to duty.

Basic training acquaints recruits with the forms and methods of hostile activity engaged in by the "enemies of the people" and with foreign espionage. Recruits for the frontier troops receive special training in patrols, traps, ambushes, search groups, and border picket duties, while interior troops receive special training in making individual, group, and mass searches, of persons, buildings, and populated localities as well as in rounding up, arresting, and conveying prisoners. About one-fourth of the instruction time during basic training is devoted to political training. After basic training,

recruits receive additional training with their units, and selected enlisted men may take special courses at special training centers and service schools. Each frontier district normally has a noncommissioned officer school. Frontier troops have their own officer candidate schools. No information is available on special officer candidate schools for interior troops. Senior officers are trained at a special institute for security troops in Moscow and at the Moscow Frontier Troops School for the Advanced Training of Officer Personnel.

The supply system for the militarized security forces is probably under the supervision of the Ministry of Defense's Chief of the Rear, who reportedly acts through military district channels after receiving projected supply requirements from the Moscow headquarters of the particular security troop agency.

1. Frontier troops

The Main Directorate of Soviet Frontier Troops, under the Committee for State Security (KGB), is responsible for the prevention of unauthorized entry into or exit from the U.S.S.R., defense of the border against sudden armed attacks, maintenance of general security control of the frontier populace, prevention of smuggling, and patrolling of offshore waters.

The Main Directorate has eight staff sections to support and exercise general supervision over the seven border districts or operational groups. The Personnel Directorate plans mobilization and training. The Operations Directorate controls border security, develops operational plans, and designates emplacement of guard posts. The Counterintelligence Directorate directs counterintelligence activities among frontier troop personnel. The Political Directorate is responsible for the promulgation of party policy and Communist doctrine among frontier troops. The Intelligence and Agents Section is responsible for gathering intelligence on the frontier zone. The Investigations Section investigates, in conjunction with the Counterintelligence Directorate, all political, military and criminal charges placed against frontier troops. The Communications Section is responsible for conducting communications intelligence operations against frontier zones of neighboring countries. The Department of the Rear plans and procures supplies.

Each frontier district or operational group is responsible for an established sector of the border. The degree of physical security precautions taken and the strength of the frontier troops committed to the sector depends on the degree of friendliness of the country facing the frontier and the importance of the Soviet installations within the area. Subordinate to the frontier district or operational group, which is usually commanded by a major general or lieutenant general, are frontier detachments, and in some cases separate *komendaturas* and an air regiment. In coastal areas sea guard squadrons, which are patrol vessel units of *komendatura* strength, are subordinate to the frontier district and may be attached to the frontier detachment for operational control. Frontier detachments range in

25X1

strength from 1,000 to 2,000 men and are usually commanded by a colonel or lieutenant colonel. Each is usually composed of three to seven *komendaturas*. These may be supported by a reserve group and, for cavalry patrol units, a cavalry remount squadron. The frontier *komendatura*, commanded by a major or lieutenant colonel, has a strength ranging from 200 to 500 personnel. It is the basic tactical unit of the frontier detachment. Subordinate to the *komendatura* are three to seven infantry or cavalry outposts with a strength of 30 to 65 men.

Frontier troop units make defense plans to include anticipated routes of enemy attack; proposed deployment and commitment of local troops; support required; and evacuation plans for the wounded, dependents, and classified documents. Joint plans are also worked out between the ground forces and frontier troop units. Some plans provide that upon notification of attack the nearest division commander designates troops to be at the disposal of the *komendatura* commander. After the division commander deploys his troops and they make contact with the enemy the division commander assumes command of the area and all troops. When the situation is stabilized, or upon orders from higher headquarters, the frontier troop unit is relieved to assume its role of rear area defense. In this role, as in World War II, frontier troops would form a continuous and mobile protective band, echeloned in depth, responsible for defense against airborne troops; road and railroad security; military traffic control; security of military depots and storage areas; holding fleeing Soviet troops; apprehending terrorists, saboteurs, and spies; general maintenance of order; and

the supervision of the evacuation of civilians from critical areas in cooperation with the interior troops.

2. Interior troops

The Soviet Interior Troops include the internal security troops, the internal and convoy guards, and the government signal troops.

Internal security troops are operational units responsible for suppressing dissident and subversive elements, quelling revolts and strikes, and controlling the civil populace in the event of disaster. They are organized into divisions and separate regiments of from 1,650 to 2,000 men each. Their weapons and equipment are similar to those of comparable units of the ground forces. Relatively small detachments are used for guarding important installations and government buildings. These troops are subordinated to the ministries for maintenance of public order of the constituent republics in which they are located.

Internal and convoy guards are responsible for the guarding of labor camps, prisons, work parties, and prisoners in transit. Convoy troops are normally organized into regiments, battalions, and companies. The guards are subordinated to the ministries for maintenance of public order of the constituent republics in which they are located.

Government signal troops are responsible for the installation, maintenance, and security of communication facilities (telephone and telegraphy) between Moscow and high-level headquarters such as military districts and groups of forces. They are organized into regiments of approximately 1,000 men and are subordinate to the Committee for State Security (KGB).

SECRET

AREA BRIEF

LAND

About 8.6 million square miles (almost one-sixth of the land surface of the earth); 11% is arable (nearly all under cultivation), 39% forest and brush, 17% used as other pasture and natural hay land, 3% urban area, and 30% desert, swamp, barren mountains, and other agriculturally unproductive areas

PEOPLE

Population: 244 million; density, 28.0 persons per square mile
 Ethnic composition: 75% Slavic, 25% among some 170 ethnic groups
 Literacy: Estimated 99.7%
 Labor force: 31.6% agricultural; 68.4% industrial and other nonagricultural fields; unemployed not reported. Excludes military
 Males 15-49: 60,470,000, approximately 80% fit for military service; about 3,352,000 reach military registration age (17) annually

GOVERNMENT

Communist dictatorship, led by Leonid I. Brezhnev, General Secretary of the Central Committee of the Communist Party; Council of Ministers (executive branch of government) chaired by Aleksey N. Kosygin; Presidium of Supreme Soviet (legislative branch) chaired by Nikolay V. Podgorny

15 Union republics divided into 20 autonomous republics, 6 *krais*, 114 *oblasts*, and 8 autonomous *oblasts*

Only party permitted: Communist Party of the Soviet Union (CPSU)

Member of United Nations and specialized agencies, CEMA, Warsaw Pact

ECONOMY

GNP: US\$475 billion (1969, in 1969 U.S. prices); \$1,978 per capita

Agriculture: Food, normally self-sufficient; principal food crops—grain (especially wheat), potatoes; main industrial crops—sugar beets, cotton, sunflowers, and flax; caloric intake, 3,000-3,200 calories per day per capita

Major industries: Diversified, highly developed capital goods industries; consumer goods industries comparatively less developed

Crude steel: 121 million-metric-ton capacity as of 1 January 1970; 110 million metric tons produced in 1969, 460 kilograms per capita

Electric power: Capacity, 154.4 million kw. (1969); output, 689 billion kw.-hr.

Foreign trade: Mostly with other Communist countries; exports (US\$11,655.3 million in 1969), fuels (particularly petroleum and derivatives), metals, agricultural products (timber, grain) and a wide variety of manufactured goods (primarily capital goods); imports (\$10,326.7 million in

1969), specialized and complex machinery and equipment, textile fibers, consumer manufactures, and any significant shortages in domestic production

Significant shortages: Natural rubber, bauxite and alumina, tantalum, tin, and tungsten

Conversion rate: 0.90 ruble = US\$1; 1 ruble = US\$1.11

COMMUNICATIONS

Railroads: 83,015 mi. main line track; 80,374 mi. broad gage (5'0") includes 19,138 mi. electrified; 2,641 mi. narrow gage, mostly 2'5½"

Highways: Approximately 934,000 mi.; 99,000 concrete, bituminous, stone block, cobblestone; 266,000 crushed stone, gravel; 569,000 improved and unimproved earth roads, tracks

Inland waterways: 89,000 mi. usable, includes 35 major waterways with 27,354 mi. principal navigable routes

Pipelines: Approximately 40,000 mi. natural gas; est. 25,000 mi. crude; est. 7,000 mi. refined.

Ports: 60 major, 119 selected minor ports

Merchant marine: 1,335 ships (1,000 g.r.t. and over) totaling 8,714,353 g.r.t. and 11,313,812 d.w.t.; includes 1,009 dry cargo, 249 tanker, 13 passenger-cargo, 64 passenger

Civil air: Est. 2,433 multiengine transports (20 or more passengers)

Airfields: Over 3,100 total; 522 have permanent-surface runways; 1 has runway 18,000 ft., 2 have runways 16,000-16,999 ft., 37 have runways 12,000-15,999 ft., 416 have runways 8,000-11,999 ft., 830 have runways 4,000-7,999 ft.; 15 seaplane stations

Telecommunications: Adequate for most requirements; extensive AM and FM radiobroadcast, wired broadcast, and TV network facilities; est. 9,900,000 general-purpose telephones and 31,300,000 TV receivers (1970)

DEFENSE FORCES

Personnel: Armed forces—3,528,500; ground 2,169,000; naval 474,000; air 510,000; rocket 375,500; militarized security forces 250,000

Ground forces units: 20 armies, 14 corps, 161 line divisions, and 9 artillery divisions

Naval vessels: 2 helicopter ships, 22 cruisers, 192 destroyer and escort types, 348 submarines, and 2,200 other types

Aircraft: 10,160 combat aircraft, including 972 in naval aviation

Missile launchers: ICBM, 1,474; SS-11 (variable range), 120; IRBM, 90; MRBM, 508; SA-1, SA-2, and SA-3, 1,506 sites (1,022 sites occupied); SA-5, 58 complexes (21 others under construction); ABM-1, 8 sites

Supply: Meets its own requirements for armed forces weapons and equipment of all complexities. Imports limited number of auxiliary ships of the repair, intelligence collection, and hydrographic survey types, light aircraft, and some missile components from other Warsaw Pact countries

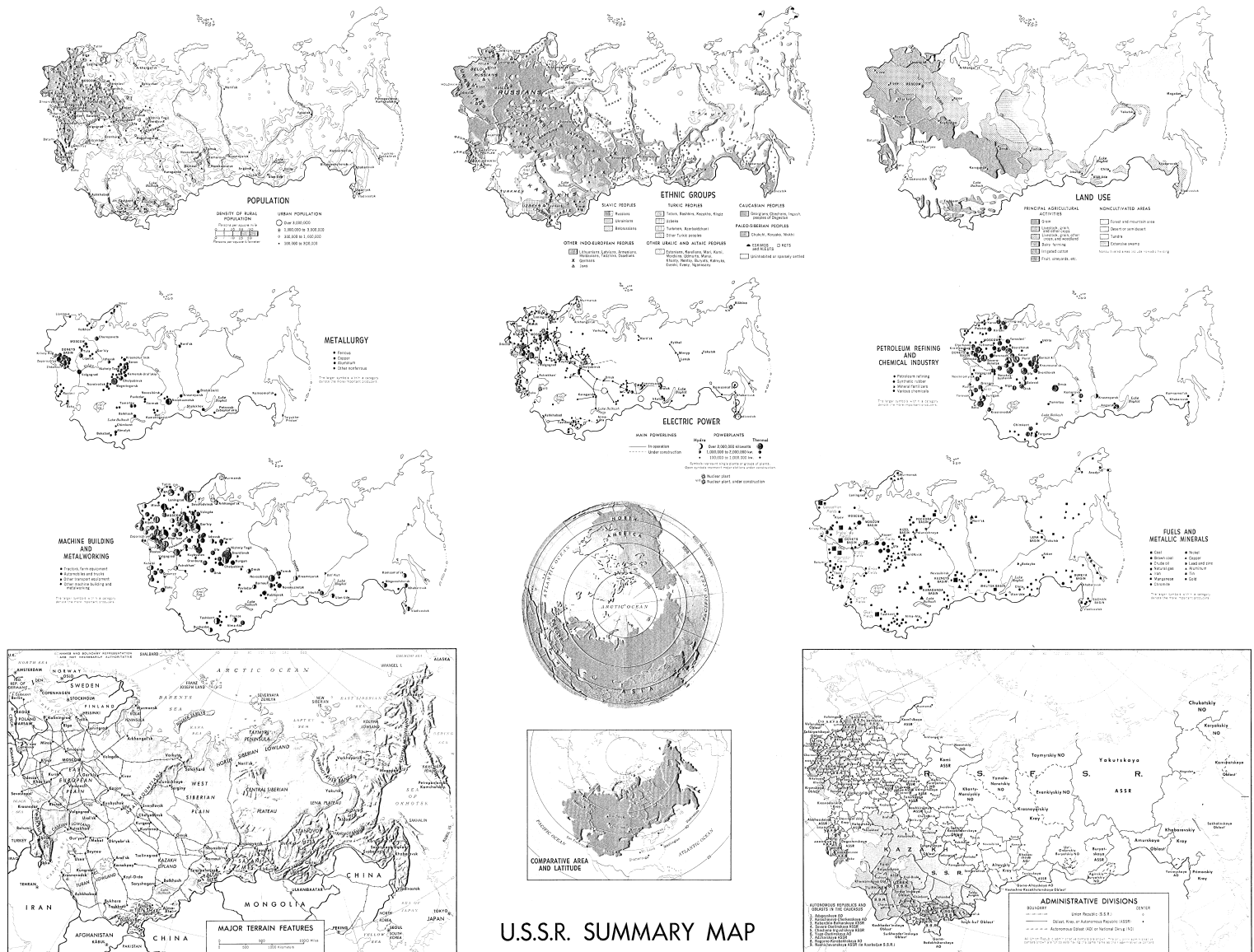
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